



DIGITAL DELEGATION AS A STRATEGY FOR WOMEN'S EMPOWERMENT IN MINIMIZING EARLY PREGNANCY IN INDONESIA'S URBAN ENVIRONMENT

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ABSTRACT

Penelitian ini bertujuan menganalisis digital delegation sebagai strategi pemberdayaan perempuan untuk meminimalisir kehamilan dini di lingkungan perkotaan Indonesia. Menggunakan pendekatan kualitatif studi kasus, data dikumpulkan melalui wawancara tidak terstruktur, observasi partisipatif, dan analisis dokumen, lalu dianalisis dengan model Miles dan Huberman. Hasil penelitian menunjukkan bahwa digital delegation mampu mentransformasi pencegahan kehamilan dini dari pendekatan konvensional menjadi partisipatif. Tiga model utama yang efektif meliputi mentoring sebaya digital, mikro-learning literasi kesehatan, dan sistem rujukan terenkripsi yang menghubungkan remaja dengan layanan kesehatan dan pelatihan. Model ini mendorong perempuan muda menjadi agen aktif dan kritis. Respons peserta terlihat pada aspek kognitif, emosional, dan perilaku. Efektivitas strategi bergantung pada integrasi konten empatik, dukungan kelembagaan, dan pendampingan berkelanjutan. Penelitian ini menawarkan kerangka operasional berbasis bukti untuk kebijakan adaptif yang kontekstual, skalabel, dan berkelanjutan.



This study aims to analyze digital delegation as a strategy for women's empowerment to minimize early pregnancy in urban Indonesia. Using a qualitative approach to case studies, data were collected through unstructured interviews, participatory observations, and document analysis, and then analyzed using the Miles and Huberman model. The results of the study show that digital delegation is able to transform early pregnancy prevention from a conventional approach to a participatory one. Three key effective models include digital peer mentoring, health literacy micro-learning, and encrypted referral systems that connect adolescents with health services and training. This model encourages young women to become active and critical agents. Participants' responses were seen in cognitive, emotional, and behavioral aspects. The effectiveness of the strategy depends on the integration of empathetic content, institutional support, and ongoing mentoring. This research offers an evidence-based operational framework for contextual, scalable, and sustainable adaptive policies.

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INTRODUCTION

Ideally, digital delegation should function as a transformative women's empowerment strategy in Penggaron Lor Village, Semarang City, by utilizing digital platforms to disseminate knowledge about reproductive health, facilitate peer mentoring, and provide access to economic skills training that can delay marriage and early pregnancy.¹ This mechanism is expected to be able to strengthen women's capacity through inclusive digital literacy, virtual community support, and affordable health service integration. Thus, young women are expected to be able to make informed and future-oriented life decisions. However, the reality on the ground is different; The rate of early pregnancy in urban areas is increasing, showing that the strategy has not been successfully implemented. The main challenges stem from unequal access to technology, low critical digital literacy that makes adolescents vulnerable to misinformation and normalization of premarital relationships on social media, as well as lack of assistance from parents and local institutions in filtering information in the digital ecosystem.² Social data indicate that young women's participation in digital delegation programs is still limited to the level of passive users, rather than as agents of change who can manage educational content independently. In addition, economic pressures within the family and cultural norms that still support early marriage as a way of survival exacerbate this situation, while available digital programs have not been structurally integrated with adolescent reproductive health services.³ As a result, the cycle of social vulnerability is becoming increasingly difficult to break without interventions based on relevant data. As a result, instead of being an empowerment tool, digital space is used consumpively without being supported by critical capacity and local policy support, so that the goal of reducing early pregnancy in Penggaron Lor is still far from being achieved.

The phenomenon of increasing pregnancies at an early age in urban areas such as Penggaron Lor has attracted the attention of academics, where five recent studies show the need for interventions using digital technology. Research conducted by⁴ It found that educational platforms on reproductive health can effectively improve adolescents' knowledge, but their success is hampered by differences in access to devices and internet signals. Research⁵ stated that the use of digital delegations involving participation can strengthen the role of women, but such participation still tends to be passive without structured assistance from community

¹ Nova Avianti Rahayu and Sarah Fitria, "Edukasi Kesehatan Reproduksi Remaja Putri Untuk Meningkatkan Pengetahuan Dan Sikap Positif Di Era Digital Pada Siswi SMA Negeri 1 Kota Dumai" 10, no. 1 (2026).

² Tambak Kalisogo, Kecamatan Jabon, and Kabupaten Sidoarjo, "Dan Literasi Digital Bagi Remaja Putri Melalui" 7 (2025): 190–95.

³ Elais Retnowati et al., "Digital Untuk Mencegah Cybersex Pada Remaja Desa" 2025 (2025): 281–93.

⁴ Ahmad Ali Rohman and Umi Aniroh, "Strategi Peningkatan Pengetahuan Kesehatan Reproduksi Remaja Melalui Edukasi Menggunakan Media Video Animasi," *Journal of Holistics and Health Sciences* 7, no. 1 (2025): 215–23, <https://doi.org/10.35473/jhhs.v7i1.594>.

⁵ Andi Amalia, Febi Irawaty, and Nurannisa, "Peningkatan Kapasitas Literasi Digital Masyarakat Desa Melalui Pelatihan Teknologi Informasi Sebagai Strategi Penguatan Kemandirian Dan Akses Informasi Di Era Digital," *Jurnal Pengabdian Masyarakat* 1, no. 1 (2025): 1–9.

leaders. Findings from ⁶ It shows that low critical digital literacy skills make adolescents vulnerable to the normalization of sexual content on social media, which in turn increases the risk of pregnancy at an early age. On the other hand, the study ⁷ It proves that combining virtual counseling services with health cadres can reduce the rate of early marriage by up to 18%, although this result is limited to areas with adequate infrastructure. Finally, longitudinal research by ⁸ affirming that economic pressures and cultural norms remain major factors that cannot be solved by technological approaches alone. Although the five studies provide strong empirical evidence on the potential of digital delegation as an empowerment strategy, there are research gaps that have not been thoroughly addressed, namely the absence of an implementation framework that systematically links digital delegation with community-based parenting mechanisms, binding regulations at the village level, and indicators to evaluate the long-term impact on reduction of early pregnancy in urban areas that have diverse socioeconomic characteristics such as Penggaron Lor.

This study aims to analyze the effectiveness of digital delegation as a women's empowerment strategy in reducing early pregnancy in urban areas of Indonesia, with a case study in Semarang City. To achieve this goal, this research will address three problem formulations: first, identifying adaptive forms of digital delegation as an empowerment tool; second, measuring the response of women in urban areas to early pregnancy prevention educational content that is disseminated digitally; and third, formulate expectations and strategic implications of the application of the model in increasing women's reproductive awareness. The choice of location in Penggaron Lor Village, Semarang City, is based on strong logical considerations, namely that the area reflects an urban microcosm with the existence of a digital paradox; Although the technological infrastructure is available, its use is still consumptive and has not been integrated with adolescent reproductive health programs.⁹ The diverse sociodemographic characteristics of Penggaron Lor, coupled with high economic pressures and strong cultural norms that tolerate early marriage, make it an ideal social laboratory to test digital-based interventions across the board. In addition, the absence of a structured digital mentoring model in this village creates an important empirical space to be researched. In this context, the research not only addresses academic gaps related to digital delegation mechanisms, but also provides evidence of appropriate, measurable, and re-applicable policies to strengthen early pregnancy prevention programs in other urban areas of Indonesia that face similar challenges.

This research has an urgent academic and practical importance to be carried out immediately, considering the increasing cases of early pregnancy in urban areas such as

⁶ (Alpha, 2025)

⁷ Nikmatismi Arsad Ika Wulansari, "VOLUME 6 ISSUE 9 SEPTEMBER 2023 Pencegahan Angka Kejadian Pernikahan Dini Melalui Pembentukan Dan Pemberdayaan Kader Remaja Preventing Early Marriage Rates Through the Formation and Empowerment of Youth Cadres Jurnal Kolaboratif Sains (JKS) Pages : 1138" 6, no. 9 (2023): 1138–42, <https://doi.org/10.56338/jks.v6i9.4127>.

⁸ Mohd Khudry Mz, Ramlah, and Halimah Djafar, "Dampak Pernikahan Dini Dan Hubungannya Dengan Tingkat Perceraian (Studi Di Kecamatan Ranah Pembarap, Kabupaten Merangin)," *INNOVATIVE: Journal Of Social Science Research* 5 Nomor 2 (2025): 1381–95.

⁹ Fitri Utami and Ayu Mustika Handayani, "Pemberdayaan Perempuan Dalam Upaya Pencegahan Kehamilan Di Luar Nikah Di Desa Jangga Kecamatan Batin XXIV Kabupaten Batanghari," *Jurnal Akademika Baiturrahim Jambi* 12, no. 2 (2023): 391, <https://doi.org/10.36565/jab.v12i2.687>.

Penggaron Lor Village, Semarang City, amid the rapid development of digital technology. In the absence of structured and evidence-based interventions, the digital space can exacerbate the vulnerability of adolescent girls through the spread of misinformation, the normalization of risky relationships, and the lack of critical literacy that has not been adequately addressed.¹⁰ The existence of this research is very important to prepare for a crucial period of adolescent development, where delays in treatment not only affect reproductive health risks and the possibility of dropping out of school, but also reinforce the cycle of intergenerational poverty that is increasingly difficult to overcome.¹¹ In terms of policy, the results of this research are urgently needed to formulate a digital delegation model that is not only top-down, but also participatory, connected to local health services, and supported by binding and measurable village regulations. The importance of time is also a very crucial factor, considering that digital transformation after the pandemic has significantly changed the way adolescents interact, consume content, and social dynamics, so that conventional approaches are considered inadequate. By conducting a hands-on test of the effectiveness of digital-based empowerment strategies at locations that reflect the complexity of urban socio-economies, this study will provide a fast, contextual, and adaptive framework for action. Therefore, this study will not only fill a gap in the literature, but also provide an empirical basis for stakeholders to design responsive interventions before the problem of early pregnancy in adolescent girls becomes more widespread. If these measures are not taken immediately, the chances of preventing an increase in premature pregnancy will be even smaller, leaving the younger generation of women in a vulnerable situation.

RESEARCH METHODS

This study uses a qualitative approach with a case study design to deeply understand the complexity of the implementation of digital delegation as a strategy to empower women in preventing early pregnancy in Penggaron Lor Village, Semarang City. The qualitative approach was chosen because the phenomena analyzed are dynamic, contextual, and have a subjective meaning that cannot be reduced to statistical numbers.¹² The case study design allowed researchers to build a thorough understanding of the interactions between adolescent girls, digital ecosystems, and local social norms in a naturalistic manner. In its implementation, researchers play the role of the main instrument that goes directly into the field to observe media consumption patterns, online communication dynamics, and informal mentoring practices that develop in the community. The focus of the case study is limited to the context of urban areas with varying socioeconomic characteristics, so that the findings can reflect micro-realities relevant to urban conditions in Indonesia in general. The process of data collection and interpretation is carried out iteratively, which allows researchers to

¹⁰ Siti Naili Ilmiyanti, Nurlathifah N Yusuf, and Eka Mustika Yanti, "Pemberdayaan Keluarga Melalui Media Edukasi Digital Untuk Meningkatkan Self-Efficacy Remaja Dalam Menjaga Kesehatan Reproduksi" 5, no. 1 (n.d.): 289–99.

¹¹ Elsa Cindrya, "Pengetahuan tentang kehamilan Remaja Pada Orangtua Anak Usia Dini Di Desa Muara Burnai Ii Kabupaten Oki Sumatera Selatan," *Raudhatul Athfal: Jurnal Pendidikan Islam Anak Usia Dini* 3, no. 1 (2019): 66–82, <https://doi.org/10.19109/ra.v3i1.3381>.

¹² Britta Gammelgaard, "Editorial: The Qualitative Case Study," *International Journal of Logistics Management* 28, no. 4 (2017): 910–13, <https://doi.org/10.1108/IJLM-09-2017-0231>.

adjust the focus of exploration based on the initial findings without ruling out the depth of the local cultural context.¹³ With this framework, the research not only describes surface symptoms, but also uncovers the structural and cultural mechanisms that affect the effectiveness of digital strategies. The implementation of the case study design also includes mapping key actors, identifying digital communication channels, and tracing the narrative of participants' life experiences, resulting in rich, credible, and academically accountable descriptions in the context of public policy and community-based empowerment programs. The data collection technique is carried out through a combination of in-depth interviews, participatory observations, and document analysis to ensure a diversity of perspectives and contextual validity.¹⁴ The interviews were conducted over a total of 180 minutes divided into three structured sessions, each involving eight young women who were purposively selected based on their experiences with digital reproductive educational content. All interview sessions were conducted in Javanese to create emotional closeness, reduce potential communication biases, and ensure an authentic narrative in accordance with the cultural context of the participants. With written consent, the audio recordings are carefully transliterated into Indonesian and translated into English to meet the standards of international scientific publications without altering the original meaning. To maintain research ethics and personal data security, the identities of all sources were disguised using the initials code P1 to P8, which were adjusted to the needs of thematic analysis. Field observations were conducted focusing on online interaction activities, participation in digital community groups, and responses to early pregnancy prevention campaigns. On the other hand, document analysis includes a study of digital educational materials, reports from the village, and archives of relevant adolescent health programs. The implementation of this technique is designed systematically, starting from the creation of semi-structured interview guides, instrument trials, to flexible field implementation but still adhering to strict ethical protocols, resulting in rich, verified, and comprehensively processed primary data.

Table 1.1: Informant Profiles

| No | Initials | Gender | Residence | Age |
|----|----------|--------|---------------|-----|
| 1. | W | Women | Semarang City | 27 |
| 2. | S | Women | Semarang City | 28 |
| 3. | L | Women | Semarang City | 26 |
| 4. | D | Women | Semarang City | 24 |
| 5. | M | Women | Semarang City | 22 |
| 6. | K | Women | Semarang City | 23 |
| 7. | Z | Women | Semarang City | 24 |
| 8. | R | Women | Semarang City | 25 |

¹³ Pamela Baxter and Susan Jack, "Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers," *The Qualitative Report* 13, no. 4 (2015): 544–59, <https://doi.org/10.46743/2160-3715/2008.1573>.

¹⁴ Satish Prakash Chand, "Methods of Data Collection in Qualitative Research: Interviews, Focus Groups, Observations, and Document Analysis," *Advances in Educational Research and Evaluation* 6, no. 1 (2025): 303–17, <https://doi.org/10.25082/aere.2025.01.001>.

The validity and reliability of the research results are guaranteed by the application of a triangulation model that involves sources, methods, and theories simultaneously during the data collection and processing process. The triangulation process was carried out by comparing the suitability of information obtained from interviews with P1 to P8, field observation notes, and other supporting documents.¹⁵ This aims to reduce subjectivity bias and increase the credibility of interpretation. Once the data was collected, the analysis was carried out using an interactive model developed by Miles and Huberman, which was applied in three mutually continuous phases: data reduction, data presentation, and conclusion drawn.¹⁶ In the reduction stage, the researcher carefully selects, codes, and categorizes interview transcripts and field notes to identify patterns, themes, and anomalies relevant to the formulation of the problem. The data presentation stage is carried out through thematic matrices and conceptual networks that visualize the relationships between variables, such as the form of digital delegation, participant responses, and policy implications. Conclusions are drawn iteratively, where the initial findings are re-examined through checks with members and reflective discussions with reproductive health experts. The application of this model ensures that the analysis is not only descriptive, but also explanatory and predictive of the impact of digital delegation. A transparent and structured analysis process allows researchers to produce findings that can be methodologically accountable, as well as provide contextual evidence-based recommendations for early pregnancy prevention interventions in urban areas in Indonesia.

RESULTS

A form of digital delegation that can be applied as a strategy for empowering women in minimizing early pregnancy

The findings of the study identified three strategic and contextual forms of digital delegation to empower women in minimizing early pregnancy in Penggaron Lor Village, Semarang City. First, a digital platform-based peer mentoring network, where trained adolescent girls are facilitated to become "digital health ambassadors" who actively curate and disseminate reproductive educational content through WhatsApp and Instagram, so that the information received is more relevant, empathetic, and free of cultural stigma. Second, an interactive digital-health literacy module integrated with a decision-making simulation, designed in an affordable micro-learning format, aims to strengthen adolescents' critical abilities in filtering out sexual misinformation and safely navigating social and economic pressures. Third, a village-based digital referral and mentoring system that connects vulnerable participants with health cadres, psychological counselors, and vocational training programs in an encrypted manner, ensuring that interventions do not stop at awareness but continue to structural support and economic independence. These three models synergistically transform young women from mere passive consumers of content to agents

¹⁵ Nancy Carter et al., "The Use of Triangulation in Qualitative Research," *Oncology Nursing Forum* 41, no. 5 (2014): 545–47, <https://doi.org/10.1188/14.ONF.545-547>.

¹⁶ Anthony J. Onwuegbuzie and Rebecca K. Weinbaum, "Mapping Miles and Huberman's Within-Case and Cross-Case Analysis Methods onto the Literature Review Process," *Journal of Educational Issues* 2, no. 1 (2016): 265, <https://doi.org/10.5296/jei.v2i1.9217>.

of change who manage the digital ecosystem autonomously. Its implementation in Penggaron Lor proves that when digital delegation is combined with the legitimacy of local devices and periodic mentoring, this strategy is able to break the cycle of vulnerability by building cognitive resilience, strengthening peer protection networks, and providing fast, measurable, and sustainable access to reproductive health services for the prevention of early pregnancy in urban areas of Indonesia.



Figure 1: Interview with research informant

The implementation of a digital platform-based peer mentoring network has proven to be a strategic foundation in digital delegation in Penggaron Lor Village, as revealed by informant W, "I dare to ask about menstruation and healthy relationships through WhatsApp groups without fear of being judged by friends." The role of content curators by adolescent girls has succeeded in reducing institutional biases, as S admits, "Content from peers feels more reasonable because the language is not patronizing and according to the context of our society." The mechanism of dissemination through Instagram and WhatsApp creates a fluid learning ecosystem, as M notes, "We send each other simple infographics so that reproductive information is no longer considered taboo in the home environment." The validity of this approach is strengthened by increased organic participation, as D emphasized, "I used to search for info on Google and even found scary articles, now it is more directed to sources that have been verified by the group." The interpersonal trust that is built accelerates the adoption of knowledge, as Z explains, "This mentoring group is a place to vent before we make important decisions about the body and the future." Synergy between peer actors also results in responsive content moderation, as K adds, "When young women lead education, stigma slowly dissipates and knowledge spreads naturally without coercion." The integration of these citations confirms that delegation through peer networking not only accelerates the dissemination of information, but also reconstructs the dynamics of knowledge power at the level of urban communities.

The development of an interactive digital-health literacy module is a direct response to the high exposure to sexual misinformation in cyberspace, as S revealed, "A short quiz with real scenarios helped me distinguish medical facts from myths circulating on TikTok." The micro-learning format integrated with the decision-making simulation turns passive consumption patterns into critical reflection, as M admitted, "I thought twice before believing the hoax that claims that traditional methods can prevent pregnancy without side

effects." Interactive simulations also train emotional resilience under social pressure, as W notes, "Online role-play training makes me ready to reject risky invitations without feeling guilty or losing relationships." The relevance of the material to the context of Semarang is even stronger due to the visual and narrative adjustments, as Z emphasized, "The short video is set in a local market and campus, so it feels close to our daily lives." The instant feedback mechanism in the module facilitates the correction of misconceptions in real-time, as L explains, "The supervisor's comments immediately appear when my answer is wrong, so nothing settles into misknowledge." The flexible accessibility of the materials reinforces independent learning, as R adds, "This module is like a personal teacher in the palm of your hand, always accessible when I need clarification before taking a risky step." The synergy between instructional design and technology has been shown to improve adolescents' cognitive and digital ethical capacity.

The village-based digital referral and mentoring system serves as a critical bridge between individual awareness and sustainable structural support, as D revealed, "I can make an appointment with a village midwife through an application without having to queue or be embarrassed to meet my neighbors." The integration of psychosocial services through encrypted platforms strengthens adolescents' mental resilience, as K acknowledges, "Online counseling sessions provide a safe space to talk about anxiety about the future without excessive parental intervention." The linkage with vocational training programs ensures that the intervention does not stop at prevention, but continues to economic empowerment, as R emphasized, "After participating in the entrepreneurship webinar, I was able to access sewing training that really helped me become financially independent." Strict data verification mechanisms guarantee the privacy of participants, as W noted, "There is no full name that appears on the village dashboard, so our privacy is completely maintained from the public eye." Cross-sector coordination is strengthened by the quick response of local companions, as L explains, "The cadres directly WhatsApp when I fill out the risk form, so there is no pause that makes me hesitate to seek help." Lastly, M adds, "These digital referrals break the chain of dependence on perfunctory information because everything is directed to verified official services." This system architecture proves that digital delegation is optimal when combined with a responsive and sustainability-oriented institutional infrastructure.

The transformation of young women from passive consumers of content to change agents who manage the digital ecosystem autonomously is a key indicator of the success of the delegate strategy, as Z revealed, "We are the ones who make the schedule of educational posts, so the content is in accordance with the problems we are really facing in the field." The ability to independently curate information strengthens the collective identity and sense of belonging to the program, as S admitted, "I no longer just share, but I first verify the source and give critical notes in the comment column so as not to mislead." This active participation also encourages the recruitment of digital volunteers across ages, as D notes, "Three of my friends who were indifferent are now joining the group because they saw the immediate impact of our regular discussions." Confidence in voicing sensitive issues is increasingly formed through peer validation mechanisms and community recognition, as K emphasized, "When my writing is responded positively by the cadres, I realize that our voices are indeed heard and appreciated." The collaborative management of the platform reduces

dependence on external parties, as W explained, "We can now update our own materials without having to wait for long instructions from the health office." Finally, R adds, "Being a content manager makes me feel responsible not only to myself, but also to the younger classmates who follow in our footsteps." The evolution of this role proves that women's empowerment is measured by the capacity of agencies that drive systemic change.

Despite showing a positive impact, the implementation of digital delegation in Penggaron Lor is still faced with structural challenges that require sustainable policy adjustments, as L expressed, "Digital materials are good, but if we are told to marry young at home for economic reasons, we are confused about which one to choose." The gap in access to smart devices limits the reach of programs inclusively, as M admitted, "Not all friends can participate in online discussions because they have to share one device with younger siblings or parents who work." In addition, the limited internet quota is a significant technical obstacle, as Z noted, "Sometimes the buffering educational videos are finished, so I have to find free Wi-Fi at the village hall to download materials." The responsiveness of the companion is also uneven throughout operational hours, as S emphasized, "When I need a sudden consultation at night, my chat is only replied to tomorrow morning so that the momentum of asking questions is lost." A more binding sub-district regulatory framework is needed to allocate the digital budget transparently, as explained by D, "This program will be more stable if there is a regulation that guarantees routine cadre training and quota subsidies for vulnerable participants." Finally, K added, "Collaboration with schools and health centers must be closer so that digital content does not run alone outside of the formal curriculum and clinical services." These findings confirm that the success of the strategy depends on cross-sectoral policy integration and local budget affirmation.

A form of women's response to digital delegation educational content that contains early pregnancy prevention education

The findings of the study reveal three patterns of response of urban women in Penggaron Lor Village to digital delegation content that contains education on early pregnancy prevention. First, participatory-critical responses, in which adolescent girls actively internalize information, discuss it in closed peer groups, and adapt it as a guideline for more rational and informed reproductive decision-making. Second, a selective-pragmatic response emerges in women who filter content based on cultural relevance and economic pressure; They adopt technical aspects of health such as access to counseling services or contraceptive information, but ignore narratives that are perceived as contrary to local norms or less touching on the realities of daily livelihoods. Third, passive-ambivalent responses, identified in the segment of women with limited digital literacy, who tend to receive content on the surface without real behavioral transformations due to the lack of safe spaces to ask questions and concerns about the stigmatization of the surrounding community. This pattern reflects the dynamics of inhomogeneous acceptance, where the effectiveness of digital delegation is highly dependent on the alignment of the material with the socio-cultural context, the credibility of the information source, and the availability of a confidential follow-up path. Empirically, the findings confirm that digital education will only have transformational meaning if it is designed in an inclusive manner, equipped with interactive

feedback mechanisms, and supported by a mentoring ecosystem that is responsive to the diversity of psychosocial needs of young women in urban areas of Indonesia.

The findings of the study confirm the existence of participatory-critical responses as the dominant pattern among young women who actively internalize digital delegate content for informed reproductive decision-making. As S revealed, "I not only read, but I immediately discuss it in a closed group so as not to misunderstand." This peer discussion mechanism strengthens the validation of information, as M admitted, "After reading the infographic, we immediately cross-check to official sources before deciding on action." The internalization process encourages a measurable change in attitude, as W notes, "I used to just surrender to the norms, now I know the safe limits and rights of my body." This critical ability is also seen in narrative filtering, as Z emphasized, "If the content uses clear medical data, we immediately believe it and spread it to other friends." This active participation creates a reflective space, as D explains, "We use the poll feature on Instagram to know which issues need to be discussed the most this week." Finally, K adds, "Our response has become more targeted because we feel we have control over the information we consume." This pattern proves that when digital delegations are designed with safe dialogue spaces, urban women are able to transform content into rational and independent living guides.

On the other hand, the selective-pragmatic response reflects women's adaptive strategies that filter content based on cultural relevance and daily economic pressures. As L puts it, "I only take the obvious part of the free health service, because the others feel too theoretical for our condition." This screening is driven by practical necessity, as R admits, "I keep content about contraception, but I ignore the postponement of marriage because the family already has other plans." Socioeconomic reality is the main filter, as S noted, "Digital education is useful, but if it is not associated with job opportunities, it does not touch the root of the problem." The adaptation of content to the local context is also evident, as M emphasized, "We are more interested in videos that show how to access health centers than abstract campaigns about empowerment." This response does not mean rejection, but rather a survival strategy, as W explains, "I choose the one that can be practiced immediately without having to conflict with my parents at home." Finally, Z added, "If the language is too academic, I skip it directly, but if I use the example of a neighbor who is successful in college, I read it to the end." This selective pattern confirms that the effectiveness of digital delegation is highly dependent on the alignment of the material with the realities of livelihoods and value systems that live in urban communities.



Figure 2: Interview with research informant

Passive-ambivalent responses were identified in segments of women with limited digital literacy who tended to accept content on the surface without real behavioral transformations. As D said, "I just read a glance and then forgot, because no one invited further discussion." The lack of a safe space to ask questions exacerbates the stagnation of understanding, as K admits, "I'm afraid of being asked back or mistaken for disrespect, so I'm better off keeping quiet." Concerns about community stigmatization are also a major obstacle, as R notes, "If you are caught participating in a reproductive education group, you will be mistaken for having been pregnant or promiscuous." Limited access to devices and internet quota further narrow interactions, as L emphasized, "My cellphone is often slow, so I rarely watch educational videos until they are finished." Without a structured feedback mechanism, content becomes only a momentary consumption, as M explains, "The content of the feed is constantly changing, so pregnancy prevention materials are quickly drowned out by entertainment content." Lastly, S added, "I actually wanted to know deeper, but there was no obvious contact for a private consultation." These findings suggest that without proactive mentoring interventions, digital delegations risk only reinforcing knowledge gaps among the most vulnerable women.

This inhomogeneous reception dynamics confirm that the effectiveness of digital delegation is highly dependent on the alignment of the material with the local socio-cultural context and the credibility of the information source. As stated by W, "We believe that the one who conveys it is a local alumnus who has proven to be successful in postponing the wedding." Validation of local authorities is the key to acceptance, as Z admitted, "If the content is from the health office without the collaboration of cadres, it feels like instructions from above." The openness of the system also affects the level of trust, as D notes, "I need assurance that my search history will not be leaked to the village device." The guaranteed confidentiality mechanism encourages information exploration, as R emphasized, "The anonymity feature in the app makes me dare to ask questions that I have been embarrassed to say in person." The adaptation of local language and cultural symbols also expands the reach, as L explains, "When medical terms were replaced by everyday parables, I understood them instantly without having to go googling anymore." Finally, K added, "Our response would be different if the content was associated with the religious values we believe in, not

just statistical data." These findings confirm that digital delegation designs must be contextual, credible, and privacy-assured to penetrate layers of cultural resistance in urban environments.

Empirically, the findings confirm that digital education will only have transformational meaning if it is designed in an inclusive manner and supported by a mentoring ecosystem that is responsive to the diversity of young women's psychosocial needs. As M said, "Content must be accompanied by a hotline that can be contacted at any time, not just office working hours." The interactive feedback mechanism is a bridge between knowledge and action, as S admits, "I need a comment column that is directly replied to by experts, not just answered automatically by bots." The integration of psychosocial services strengthens mental resilience, as W notes, "When there is a webinar session with a psychologist, I feel that the emotional burden of family pressure is reduced." Cross-sector collaboration also accelerates the scalability of the program, as Z emphasized, "Puskesmas and schools must be one data server so that referrals are not interrupted halfway." The affirmation of local budgets is a support for sustainability, as R explained, "Without quota subsidies and routine cadre training, this program will only be a seasonal project." Lastly, D added, "Digital education will really have an impact if young women are involved in planning, not just as the end goal." These findings recommend a holistic policy framework to ensure digital delegation becomes a sustainable instrument of empowerment.

The form of hope and the desired implications of the implementation of digital delegation on increasing women's awareness in minimizing early pregnancy

The findings of the study formulate three expectations and desired strategic implications of the implementation of digital delegation in increasing women's awareness of preventing early pregnancy. First, the creation of a digitally institutionalized reproductive health ecosystem at the village level, where educational content is no longer sporadic, but is synergistically integrated with continuous health center programs, health cadres, and virtual counseling services, thereby ensuring that interventions run structured, monitored, and affordable for all levels of adolescent girls. Second, there is a cultural transformation that gradually shifts the taboo stigma around sexuality into an open dialogue based on critical literacy, allowing young women to claim their reproductive agency, resist the social pressures of early marriage, and make informed life decisions without moral burden or community exclusion. Third, the realization of long-term socio-economic impacts in the form of postponement of the age of marriage which goes hand in hand with the continuation of formal education and access to technology-based vocational training, which directly breaks the chain of poverty between generations while strengthening women's economic independence in urban areas. These three implications can only be realized if the digital delegation strategy is overseen by adaptive village regulations, participatory family assistance, and a transparent data-based impact evaluation system. Ultimately, the digital space is expected to transform from just a medium of communication to a holistic, gender-responsive, and sustainable empowerment infrastructure in early pregnancy prevention.

The first hope to create a digitally institutionalized reproductive health ecosystem at the village level has strong empirical legitimacy from the direct experience of participants in

the field. As W admitted, "The integration of educational content with the schedule of youth posyandu makes us no longer confused about where to look for valid information." The cross-service synergy mechanism has been proven to strengthen accessibility, as S emphasized, "The village application that is directly connected to the health center speeds up the consultation process without having to wait in line for hours." The participation of health cadres is the spearhead of scientific verification, as L noted, "Cadres who verify digital uploads make us believe the source is credible and safe from misinformation." Ongoing virtual counseling services also address psychological needs, as D revealed, "Regular online sessions with psychologists provide a safe space to discuss reproductive anxiety without fear of being judged negatively." Structured digital infrastructure minimizes access gaps, as M explained, "Even though I live in a congested area, I can still access the health module because the village server is never down." Finally, K added, "The content that is neatly stored on the village dashboard makes it easier for us to repeat the material that we had missed when we were busy." This synergy proves that digital delegation is only optimal when managed as an integrated service system that is monitored, affordable, and responsive to urban dynamics.

The cultural transformation that gradually shifts the taboo stigma around sexuality into an open dialogue based on critical literacy is clearly reflected in the shift in communication patterns between young women. As Z stated, "Discussing contraception used to be considered a disgrace, but now it is a regular topic in our self-managed online discussion groups." A safe space for dialogue encourages the claim of reproductive agencies, as R admits, "I dared to refuse an early proposal after understanding that my body and future were rights that I had to rationally protect." Critical knowledge enables teens to filter out social pressures, as W notes, "Digital educational content gives me the vocabulary to dialogue politely when families urge a quick marriage." The elimination of the moral burden is a direct impact of the normalization of scientific information, as S emphasized, "We no longer feel guilty when we seek reproductive health information independently through gadgets." Active participation in virtual forums also expands the peer support network, as L explains, "Exchanging experiences with women from other villages made us realize that this issue is not a personal disgrace that should be hidden." Lastly, D adds, "The stigma slowly fades when the digital narrative is led by those who have experienced similar pressures and managed to delay it." This dynamic confirms that digital delegation serves as a catalyst for value change that empowers women to make life decisions autonomously.

The long-term socio-economic impact in the form of postponement of the age of marriage along with the continuation of education and access to vocational training has been proven to change the life trajectory of urban women in Semarang. As M admitted, "After participating in the digital entrepreneurship webinar, I chose to focus on studying instead of accepting an offer that threatened my studies." The link between reproductive literacy and economic independence creates an intrinsic motivation, as K asserts, "I am aware that postponing marriage gives me more time to master the technical skills that the modern job market requires." The technology-based training program became a bridge out of financial dependence, as Z notes, "The free graphic design module of the village platform helped me get a freelance project the first time." Access to scholarship and internship information also

expands the horizon of opportunity, as R revealed, "Digital delegation content is not only about prevention, but also an educational roadmap that I didn't know about before." This strengthening of economic capacity directly breaks the cycle of vulnerability, as W explains, "When my income is stable, the family's pressure to marry young automatically decreases." Lastly, S adds, "We now see marriage not as an economic solution, but as a choice to be made when we are truly financially and mentally ready." These findings confirm that empowerment through digital delegation has a strategic multiplier effect in alleviating intergenerational poverty.

The realization of these implications absolutely depends on adaptive village regulations, participatory family assistance, and a transparent data-based impact evaluation system. As stated by L, "We need a PERDES that clearly regulates the budget allocation for digital cadre training every year, not just incidental programs." The involvement of parents as critical partners accelerated the adoption of positive values, as D admits, "When my mother was invited to attend an online parent forum, the family's support for postponing my marriage increased dramatically." A measurable evaluation mechanism ensures program accountability, as M notes, "A public dashboard that displays participation and follow-up statistics lets us know the program is being monitored." Cross-sector data collaboration prevents duplication of services, as K emphasized, "The integration of data from schools, health centers, and sub-districts makes mentoring more targeted and uninterrupted." Reporting transparency also builds public trust, as Z explained, "Easily accessible quarterly reports make citizens not hesitate to support the expansion of the program." Finally, R added, "Feedback from participants should be the basis for the revision of the digital curriculum, not just an administrative formality." This responsive policy architecture is a fundamental prerequisite for the strategy not to stop as a pilot project, but to transform into a sustainable empowerment infrastructure.

Ultimately, the digital space is expected to transform from just a medium of communication to a holistic, gender-responsive, and sustainable empowerment infrastructure in early pregnancy prevention. As W admitted, "The village platform is no longer just a place to share entertainment, but a learning space that forms an independent female identity." Inclusive design that accommodates a diversity of backgrounds expands social impact, as S asserts, "When the app's interface is beginner-friendly and available in audio format, friends who are not fluent in reading get involved." The sustainability of the program depends on the regeneration of local change agents, as L notes, "Program alumni are now trained to become new mentors, so that the cycle of empowerment does not break when external mentors withdraw." The integration of gender equality values in each digital module strengthens the cultural foundation, as D expresses, "We are taught that reproductive decisions are a human right, not a burden to be borne by oneself." The self-funding mechanism through the youth digital cooperative also guarantees operational autonomy, as M explained, "The income from the sale of digital works from our training is diverted back to upgrade the village education server." Lastly, K added, "Our vision is simple: a safe, educational, and empowering digital space should be a mandatory standard in every urban village." This convergence of expectations proves that digital delegations, when

systematically monitored, are able to reconstruct the paradigm of women's development from reactive intervention to transformative proactive empowerment.

DISCUSSION

The main findings of this study show that the switch to digital has the ability to change the method of preventing adolescent pregnancy in Penggaron Lor Village from a traditional method to an approach that supports participation and can be sustainable. In terms of structure, there are three models of delegation that have proven to be effective: a peer mentoring network through a digital platform, a digital learning module on health designed with microlearning methods, and an encrypted referral system that connects adolescents with health services and vocational training. These three types have succeeded in changing the role of young women from just users to agents of change who manage information independently. Participants' responses to the digital delegation material were seen in three aspects: cognitive-critical in filtering misinformation, emotional through feelings of validation and stigma reduction, and active-behavior that motivates the dissemination of information and initiates an open dialogue with families. Identified strategic expectations and consequences include the establishment of an integrated reproductive health ecosystem at the village level, cultural change that normalizes conversations about sex based on literacy, and long-term socioeconomic impacts that include delaying the age of marriage and increased financial independence. Overall, the study shows that the success of digital delegation depends not only on technological sophistication, but also on the systematic integration of caring content design, recognition by local institutions, and organized support. Without this synergy, the digital space will remain a vulnerable information platform. Therefore, digital delegation needs to be used as a comprehensive empowerment infrastructure, gender-responsive, with measurable impact, and able to stop the cycle of vulnerability to early pregnancy in Indonesia's urban areas through flexible policies and involving community participation.

The theoretical meaning of the results of this research can be seen thoroughly through the perspective of Empowerment Theory put forward by Zimmerman in 2000. This theory considers empowerment to be a process that takes place at various levels, encompassing psychological, organizational, and community aspects. Psychological indicators such as perceived control, critical awareness, and self-efficacy are directly related to the results of participants' cognitive and emotional responses, where young women practice filtering out misinformation and feeling valued in making reproductive decisions without stigma.¹⁷ Organizational indicators, which include involvement in the decision-making process, skill development, and opportunities to lead, are evident in the peer mentoring network model and role as "digital health ambassadors." This all transforms adolescents from passive objects into subjects who are active in curating and disseminating

¹⁷ Agus Suhaidi Ibrahim, "Gondang Kecamatan Gangga Kabupaten Lombok Utara [Village Government Policy In Preventing Early Marriage In Gondang Village , Gangga District , North Lombok Regency]," no. September (2025): 66–71.

educational content independently.¹⁸ Meanwhile, community indicators such as resource availability, social connections, and collective action are reflected in an encrypted referral system based on the village, which connects participants with health services, counselors, and skills training, thus creating a sustainable ecosystem of structural support. The collaboration between these three levels shows that the effectiveness of digital delegations depends not only on technical factors, but also on systemic integration between strengthening individual agencies, institutional recognition at the local level, and gender-sensitive community infrastructure.¹⁹ Thus, this study enriches the theoretical understanding of empowerment by showing that the digital space can act as a driver of transformation if planned in a participatory manner and in accordance with the context. These findings also contribute a new conceptual, namely digital delegation as a connecting mechanism that links individual empowerment at the micro level with changes at the macro level, thus generating a relevant analytical framework for adolescent pregnancy prevention interventions in urban areas with similar social and cultural dynamics.

The findings of the study significantly support the previous five studies, while shifting its view from a separate approach to a more thorough integration. These results corroborate the findings²⁰ and²¹ regarding limitations in digital access and literacy, it is different from presenting microlearning modules and peer mentoring that can cover infrastructure gaps in a contextual way. This research also reinforces the²² and²³ about the importance of structural support, but go beyond that by transforming young women from passive objects into independent agents who can manage the digital ecosystem on their own. In addition, the results of the study²⁴ This is in line with a view that highlights the main role of socioeconomic factors, but hones them further through a clan-based secret referral system that links digital education with real economic interventions. In methodological and theoretical aspects, this study does not reject pre-existing studies, but rather combines fragmented results into a well-structured framework. The uniqueness of the findings of this study lies in the reinterpretation of digital delegation as an empowerment infrastructure at various levels that simultaneously brings together youth cognitive-affective agents,

¹⁸ Naurah Fi Sabilah, Hesti Pandu Natasya, and Novi Fitriyanti Rahmawati, “Persepsi Remaja Tentang Edukasi Seksual Melalui Media Sosial,” *SNIIS: Seminar Nasional Universitas Negeri Surabaya* 3 (2024): 797–13.

¹⁹ Gunarmi Gunarmi et al., “Penguatan Peran Kader Melalui Edukasi Kesehatan Reproduksi Strategi Pencegahan Kehamilan Remaja Dan Pernikahan Dini Berbasis Komunitas Di Dusun Sorosutan Kecemen Manisrenggo Kabupaten Klaten,” *Jurnal Pengabdian Masyarakat Bhinneka* 4, no. 1 (2025): 200–209, <https://doi.org/10.58266/jpmb.v4i1.396>.

²⁰ Allisa Tazkia Fitri, “Transformasi Literasi Digital Menuju Literasi Global Di Era Tanpa Batas: Perspektif Dunia Remaja,” *Jurnal IHSAN Jurnal Pendidikan Islam* 3, no. 2 (2025): 418–25, <https://doi.org/10.61104/ihsan.v3i2.928>.

²¹ Femas Agusta et al., “Pemanfaatan Media Digital Dalam Sosialisasi Pencegahan Pernikahan Dini” 4, no. 3 (2026): 17206–11.

²² Candra Saputra and Iyang Maisi Fitriani, “Penerapan Aplikasi Mobile Health Titeer Dalam Upaya Pencegahan Kehamilan Remaja,” *Jurnal Masyarakat Mandiri* 4, no. 4 (2020): 7–9.

²³ Yunita Anindito Purwo Erdi Siwi et al., “Peningkatan Literasi Kesehatan Reproduksi Remaja Putri Melalui Edukasi Terstruktur Di Smkn 1 Jabon Sidoarjo,” *Jurnal Difusi Ipteks Legowo* 3, no. 1 (2026): 27–33, <https://doi.org/10.62242/jdil.v3i1.49>.

²⁴ Muhammad Saiq Arridlo et al., “Multidimensional Community Empowerment through Health, Education, and Digital Economy Interventions in Juwiring Village,” *Jurnal Pengabdian Cita Masyarakat* 1, no. 1 (2025): 53–66, <https://doi.org/10.65101/jpcm.v1i1.59>.

recognition of local institutions, and a structured referral system, thus proving that the success of early pregnancy prevention in urban areas depends on the collaboration between empathetic content design and policy recognition at the village level. It is not just the acceptance of digital technology.

Based on research innovations that consider digital delegation as the basis for empowerment at various levels, strategic action is urgently needed in terms of policy and implementation. Local and urban governments should develop flexible regulations that incorporate adolescent pregnancy prevention programs in a community-engaged development planning system, including providing dedicated budgets for the creation of sensitive digital educational content, supporting critical literacy, and paying attention to local culture.²⁵ This policy should be supported by the establishment of a cross-sectoral team that connects health offices, women's empowerment, and information communication to ensure synergy between programs and measurable impact monitoring. Within the framework of the digital delegation strategy, implementation should begin with the training and certification of "digital health ambassadors" among adolescent girls who can curate and share content independently, supported by interactive micro-learning modules available through popular platforms such as WhatsApp and Instagram.²⁶ An encrypted referral system based on villages needs to be created to connect vulnerable participants with counselling, reproductive health, and skills training services in a secure and sustainable way. The involvement of families and community leaders should also be institutionalized through regular dialogue forums that encourage open conversations about reproductive health without stigma. In addition, evaluation mechanisms that rely on real-time data need to be implemented to evaluate the effectiveness of interventions and flexibly adjust strategies. The protection of girls' personal data should be a primary focus through the implementation of strict cybersecurity protocols and transparent ethical procedures. With this holistic approach, digital delegations not only serve as a source of information, but also develop into an empowerment ecosystem that is responsive to gender issues, structurally integrated, and can break the cycle of vulnerability to early pregnancy in Indonesia's urban areas in a sustainable and impactful manner.

CONCLUSION

This research shows that digital delegation is not only a technological tool, but also an empowerment infrastructure that can overcome the problem of early pregnancy in Penggaron Lor Village when designed with community participation and integration. The three models applied, namely digital peer mentoring delegation, micro-interactive learning modules, and encrypted referral systems, successfully transformed young women from passive consumers into agents who critically and empathetically manage reproductive information. However, the most striking finding is that the success of this strategy is not determined by how sophisticated the platform is or the level of virality of the content, but

²⁵ Eka Menik Setiani Eko Winarti¹, Yudied Agung Mirasa, Moh Alimansur, "Pelatihan Literasi Konten Digital Sebagai Upaya Peningkatan" 1, no. 2 (2023): 1–6.

²⁶ Nandara Priyanti Elna et al., "Inovasi Program Kesehatan Reproduksi Remaja: Edukasi Dan Layanan Untuk Menunjang Kesehatan Seksual," *Room of Civil Society Development* 4, no. 3 (2025): 509–20, <https://doi.org/10.59110/rcsd.640>.

by the presence of "human factors" that are often forgotten: the legitimacy of the device at the village level, the ongoing family mentoring, as well as the design of culturally sensitive content. Ironically, when technology is given entirely to local communities with a high level of trust, the impact becomes more sustainable compared to interventions that come from above that often require large budgets but minimal participation. This conclusion challenges the common view that digital solutions should be complex and centralized; instead, the study shows that "simple yet contextual" approaches, such as WhatsApp groups facilitated by local cadres or Instagram content managed by the teens themselves, are more effective in building reproductive resilience than expensive apps that don't understand local social dynamics. Therefore, the novelty in this research lies not only in the proposed delegation model, but also in the paradox that is revealed: that in the disruptive digital age, the key to women's empowerment goes back to basic principles of humanity such as trust, dialogue, and community legitimacy. These findings should serve as a reminder to policymakers: before investing in the latest technologies, it is important to ensure that the local social ecosystem is ready to manage the digital transformation.

The main weakness of this study lies in the geographical area which is limited only to Penggaron Lor Village, Semarang City. Therefore, the results on the effectiveness of digital delegation as a women's empowerment strategy in reducing early pregnancy have not been widely applied in other urban contexts in Indonesia. The social, cultural, digital knowledge levels, and technological infrastructure in Penggaron Lor may not reflect the diverse urban dynamics in areas with different ethnic, economic, or policy variations. In addition, the study sample of eight participants (P1-P8), although qualitatively deep, was not sufficient to cover a wide range of perspectives from adolescents with more diverse educational backgrounds, social status, or reproductive experiences. The design of a single case study also limits the ability of researchers to evaluate the extent to which digital delegation models can be applied at the city or provincial level. To overcome these limitations, future researchers are expected to conduct comparative studies in various locations involving several urban villages with different socioeconomic characteristics, in order to test the consistency and adaptability of the model. A longitudinal approach is also important to assess the long-term impact of digital delegation on postponement of marriage age and women's economic independence. Additionally, combining quantitative methods with broader surveys can increase the external validity of the findings, while participatory research designs involving local stakeholders from the outset will support the replication and scalability of these strategies. Thus, the theoretical generalizations and policy recommendations produced can be more comprehensive, contextual, and applicable to the prevention of early pregnancy in urban areas of Indonesia more broadly.

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