



Evaluation of Hallobumil Using the System Usability Scale and User Experience Methods Among Pregnant Women in Semarang

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Abstract

Hallobumil is a mobile health application designed to provide information and education for pregnant women. Usability and user experience are critical to ensuring ease of use, relevance, and engagement, ultimately supporting better pregnancy outcomes. This study aimed to evaluate the usability and user experience of the Halo Bumil application among pregnant women in Semarang, Indonesia. A descriptive cross-sectional study was conducted involving 390 pregnant women from 15 community health centers. Data were collected through direct interviews using structured questionnaires based on the System Usability Scale (SUS) and User Experience Questionnaire (UEQ) and analyzed descriptively. The mean age of participants was 28.5 ± 5.5 years; most had senior high school education (57.4%), earned less than the local minimum wage (63.6%), were housewives (58.5%), and received health information from healthcare providers (74.1%). The mean SUS score was 62 (marginal), corresponding to Grade D, with an adjective rating of "OK." The mean UEQ scores were positive across all dimensions: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. Overall, the Halo Bumil application is considered suitable as a digital information medium to support pregnancy. These findings provide valuable insights for developers to enhance features and user-friendliness.

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Introduction

Digital health applications are increasingly used to support maternal and child health worldwide. Evidence from high-income countries shows that mobile health (mHealth) applications can reduce maternal anxiety, improve antenatal care utilization, and support healthy behaviors importance (Ameyaw et al., 2024; Mbunge & Sibiya, 2024). However, limited evidence exists from low- and middle-income countries, where contextual factors such as digital literacy, socioeconomic disparities, and health system integration may influence effectiveness.

In Indonesia, maternal mortality remains a public health priority despite recent improvements (Badan Pusat Statistik, 2020). To address information gaps, Hallobumil was introduced as an interactive pregnancy application, with over one million downloads as of 2024. Previous studies have examined Hallobumil's impact on maternal anxiety and satisfaction (Rahayu et al., 2020; Sari et al., 2023), but few have rigorously evaluated its usability and user experience using standardized international tools.

This study addresses this gap by applying the System Usability Scale (SUS) and the User Experience Questionnaire (UEQ) to assess Hallobumil among pregnant women in Semarang. Unlike prior evaluations that focused on satisfaction or single aspects of usability, this study combines both metrics to provide a more



comprehensive understanding of user perceptions and areas requiring improvement.

Hallobumil is an interactive application in Indonesia designed to assist mothers through the stages of pregnancy preparation, pregnancy, and child development (Hallobumil, 2024). Developed by PT Medika Komunika Teknologi, the Hallobumil application has been downloaded more than one million times on the Google Play Store as of October 2024. On the Google Play platform, it has received an average rating of 4.0 out of 5.0. The application offers features divided into three main phases: pregnancy planning, pregnancy, and post-pregnancy, providing maternal and child health information gradually according to users' needs. The application has undergone updates related to administrator responses to article comments, notification improvements, and performance enhancements to ensure user convenience, continuously striving to improve user experience. Hallobumil uses Bahasa Indonesia as its primary language and is equipped with expert guidance, health tracking tools, and interactive features to help users monitor maternal health and child development. An overview of the Hallobumil application is presented in Figures 1d and 2.

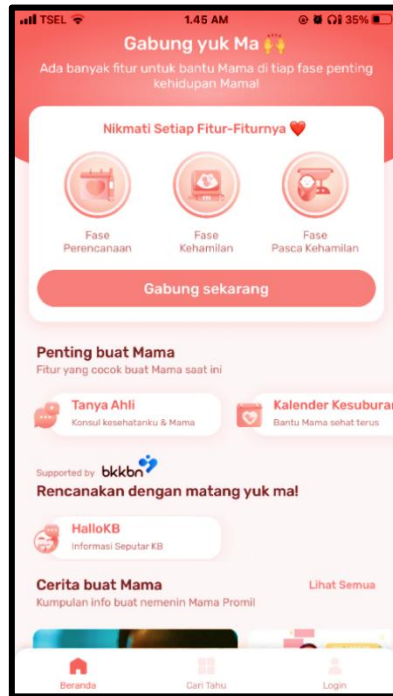


Figure 1. Initial Display

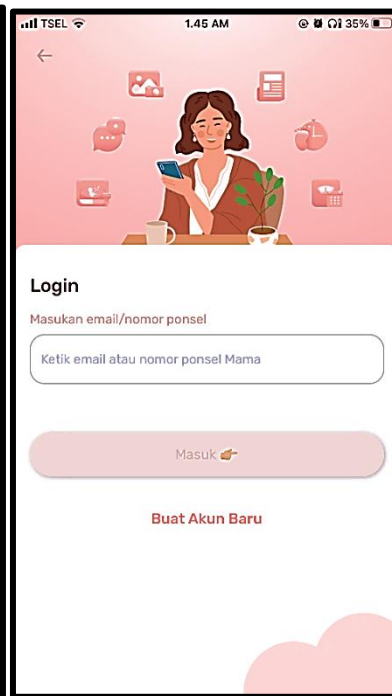


Figure 2. Login Options Page

Several previous studies have shown that pregnancy-related information-seeking behavior is carried out through pregnancy applications, in this case the Hallobumil application. Users not only download the application but also follow the Instagram account @hallobumil. This account is considered to be related to the application, as both provide relevant pregnancy information and support users' needs (Lathifah & Dewi, 2021). The usability, information quality, and service interaction of the Hallobumil application have a positive influence on user satisfaction. Service interaction within the Hallobumil application affects e-loyalty both directly and indirectly through the mediation of e-satisfaction (Sari et al., 2023). The Hallobumil application has also shown a positive impact in reducing anxiety levels among primigravida mothers in a group of pregnant women in the Ciamis area. The imagination component, in the form of fetal growth visualization and scenarios where mothers can imagine communicating with the fetus, was perceived as enjoyable and provided positive emotional responses, such as relief from discomfort and reduced anxiety (Rahayu et al., 2020).

Application evaluation is necessary to assess the extent to which the system achieves its intended goals. This is carried out by comparing the actual outcomes with predetermined criteria, serving as a basis for improvement and better decision-making. Evaluating this application is crucial to ensure whether its features function properly and meet user expectations. This study aims to evaluate the use of the Hallobumil application by employing the System Usability Scale (SUS) and User Experience (UX) among pregnant women in Semarang City.

Methods

Design, time, and study setting. This research is a descriptive study with a cross-sectional approach. The study was conducted from January to March 2025, in Semarang City.

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Population and sample. The study population consisted of 21,375 pregnant women (Semarang City Health Office, 2023). The sample size was calculated using the Isaac and Michael table (Sugiyono, 2013) with a 95% confidence level and a 5% margin of error. The recommended sample size was 349 respondents, which was increased by 10% to anticipate dropouts, resulting in a total of 390 respondents in this study.

Sampling technique, inclusion and exclusion criteria. The sampling location in this study was determined using stratified random sampling, by randomly selecting 15 community health centers (puskesmas) out of 37 available in Semarang City. Subsequently, respondents at the selected health centers were chosen purposively according to the inclusion and exclusion criteria. The inclusion criteria in this study were: (1) pregnant women residing in Semarang City, (2) receiving antenatal care at one of the 15 selected community health centers, (3) having used the Hallobumil application at least once, and (4) willing to participate in the study. The exclusion criterion was pregnant women with health conditions that prevented them from participating during data collection.

Data collection techniques, instruments, and research variables. Data were collected through structured face-to-face interviews with respondents. The research instrument was an interview guide in the form of a questionnaire. The System Usability Scale (SUS) questionnaire used in this study was adapted from Brooke, consisting of 10 items (five positively worded and five negatively worded (Brooke, 2013)). The SUS questionnaire consists of dimensions of ease of use, consistency, and clarity in application usage. The User Experience Questionnaire (UEQ) was adapted from Laugwitz, Schrepp, and Held, and translated into Indonesian (Santoso et al., 2016). The UEQ questionnaire consists of 26 items covering the following dimensions: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. Each item consists of two opposite terms, rated on a scale from 1 to 7. Table 1 presents an overview of the UEQ instrument.

Table 1. Example of UEQ Items

No	1	2	3	4	5	6	7
1	Troublesome					Enjoyable	

Data Analysis. Usability analysis obtained through the System Usability Scale (SUS) questionnaire will be interpreted based on the SUS score (Brooke, 2013). For positive items, the score is calculated by subtracting 1 from the scale position, while for negative items, the score is calculated by subtracting the scale position from 5. Items 1, 3, 5, 7, and 9 are positively worded, thus their scores are obtained by subtracting 1. Meanwhile, items 2, 4, 6, 8, and 10 are negatively worded, so their scores are obtained by subtracting the scale position from 5. The interpretation of these results refers to the established guidelines for assessing the usability level of the application.

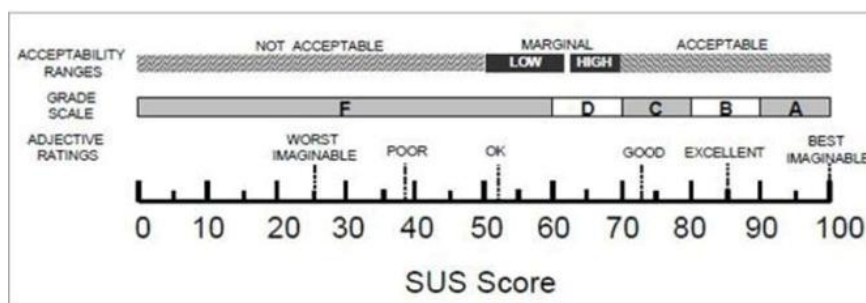


Figure 3. System Usability Scale (SUS) Score

The SUS score is divided into three main categories as follows: (1) Acceptability, consisting of Not Acceptable (mean score 0–50), Marginal (mean score 51–70), and Acceptable (mean score 71–100). (2) Grading Scale, consisting of Grade A (mean score 90–100), Grade B (mean score 80–89), Grade C (mean score 70–79), Grade D (mean score 60–69), and Grade F (mean score 0–59). (3) Adjective Rating, consisting of Worst Imaginable (mean score 0–25), Poor (mean score 26–39), OK (mean score 40–53), Good (mean score 54–74), Excellent (mean score 75–89), and Best Imaginable (mean score 90–100).

Excellent (mean score 75–85), and Best Imaginable (mean score 86–100). The results of the User Experience Questionnaire (UEQ) were analyzed using the specialized tool available at www.ueq-online.org. Referring to the guidelines of the UEQ Data Analysis Tool, mean values ranging from -0.8 to 0.8 are categorized as neutral evaluations, values above 0.8 indicate a positive evaluation, and values below -0.8 indicate a negative evaluation. The interpretation of the UEQ results was carried out based on the established scale chart/benchmark (Schrepp et al., 2019). The results of the analysis of the aspects measured in the UEQ questionnaire will be categorized into several levels based on the mean scores obtained for each dimension. The determination of these categories is based on the predefined mean value thresholds for each category, which are presented in the following table:

Table 2. UEQ Mean Value Categories (Schrepp et al., 2014)

	<i>Attractiveness</i>	<i>Perspicuity</i>	<i>Efficiency</i>	<i>Dependability</i>	<i>Stimulation</i>	<i>Novelty</i>
<i>Excellent</i>	≥1.75	≥1.9	≥1.78	≥1.65	≥1.55	≥1.4
<i>Good</i>	≥ 1.52	≥ 1.56	≥ 1.47	≥ 1.48	≥ 1.31	≥ 1.05
	< 1.75	< 1.9	< 1.78	< 1.65	< 1.55	< 1.4
<i>Above</i>	≥1.17	≥ 1.08	≥ 0.98	≥ 1.14	≥ 0.99	≥ 0.71
<i>Average</i>	< 1.52	< 1.56	< 1.47	< 1.48	< 1.31	< 1.05
<i>Below</i>	≥ 0.7	≥ 0.64	≥ 0.54	≥ 0.78	≥ 0.5	≥ 0.3
<i>Average</i>	< 1.17	< 1.08	< 0.98	< 1.14	< 0.99	< 0.71
<i>Bad</i>	< 0.7	< 0.64	< 0.54	< 0.78	< 0.5	< 0.3

Results

The average SUS score was 62 (Grade D, marginal usability), below the global benchmark of 68. Although 76.4% intended to use Hallobumil again, 26.2% required assistance and 66.9% needed adaptation time. UEQ scores were positive across all six dimensions. Perspicuity (1.7) and Stimulation (1.7) scored highest, reflecting ease of understanding and motivational aspects. Novelty (1.3) scored lowest but remained in the “good” category, indicating limited innovation compared with other applications.

Table 3. Respondent Characteristics

Variable	N	Mean	Std Deviation
Age	390	28.4	5.5
	N	%	
Highest education level			
1. Primary School	11	2.8	
2. Junior High School	54	13.8	
3. Senior High School	224	57.4	
4. College	101	25.9	
Income			
1. < Rp3,454,827.00	142	36.4	
2. ≥ Rp. 3,454,827.00	248	63.6	
Occupation			
1. Housewife	228	58.5	
2. Private sector employee	134	34.4	
3. Entrepreneur	21	5.4	
4. Civil servant	6	1.5	
5. Labourer	1	0.3	
6. Other	0	0	
Access to health information			
1. Healthcare workers	289	74.1	
2. Social media	98	25.1	
3. Print media	2	0.5	
4. Electronic media	1	0.3	
Total Respondents	390	100	

The characteristics of the respondents in this study are presented in Table 3. Table 3 shows that the total



number of respondents was 390, with a mean age of 28.4 (± 5.5) years. The majority had completed senior high school education (57.4%), had an income above IDR 3,454,827.00 (63.6%), worked as housewives (58.5%), and obtained health information from health professionals (74.1%).

Table 4 presents the distribution of respondents' answers regarding the usability of the Hallobumil application.

Table 4. Distribution of Responses to the System Usability Scale (SUS)

No.	Questions	SD		D		A		SA	
		N	%	N	%	N	%	N	%
1.	I think that I would like to use Hallobumil again.	3	0.8	15	3.8	298	76.4	74	19.0
2.	I found Hallobumil unnecessarily complex.	78	20.0	270	69.2	32	8.2	10	2.6
3.	I thought Hallobumil was easy to use.	2	0.5	17	4.4	282	72.3	89	22.8
4.	I think that I would need the support of a technical person to be able to use Hallobumil.	58	14.9	212	54.4	102	26.2	18	4.6
5.	I found the various functions in Hallobumil were well integrated.	3	0.8	6	1.5	300	76.9	81	20.8
6.	I thought there was too much inconsistency in Hallobumil.	66	16.9	282	72.3	32	8.2	10	2.6
7.	I would imagine that most people would learn to use Hallobumil very quickly.	2	0.5	14	3.6	299	76.7	75	19.2
8.	I found Hallobumil very cumbersome to use.	64	16.4	271	69.5	44	11.3	11	2.8
9.	I felt very confident using Hallobumil.	4	1.0	11	2.8	306	78.5	69	17.7
10.	I needed to learn a lot of things before I could get going with Hallobumil.	8	2.1	81	20.8	261	66.9	40	10.3

Table 4 shows that some respondents have a positive perception of the usability of the Hallobumil application. Most respondents agreed or strongly agreed that the application is easy to use, its features work well, and there are no significant obstacles during usage. Respondents also expressed confidence that they would use the application again in the future. However, several respondents mentioned that they needed some time to familiarize themselves before feeling fully comfortable using the application. Overall, these results indicate that the Hallobumil application is fairly accessible, consistent, and provides a good user experience.



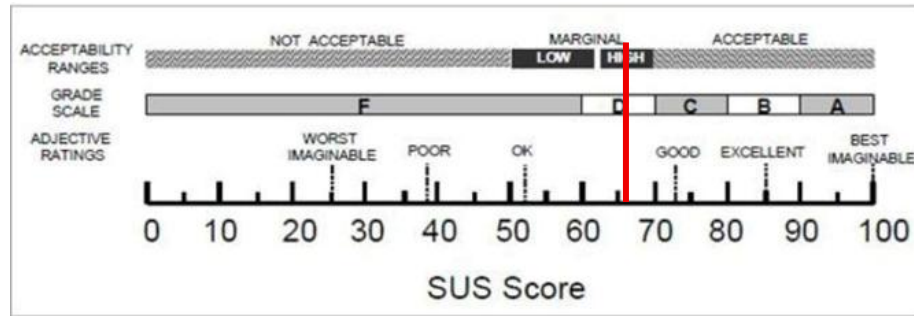


Figure 3. Usability results of the Hallobumil application based on SUS scores

Figure 3 shows that the mean SUS score was 62, with the Acceptability Range falling into the Marginal category, the Grade being D, and the Adjective Rating categorized as OK. The distribution of the User Experience Questionnaire (UEQ) responses across six dimensions is presented in Table 5.

Table 5. Distribution of Respondents' Answers to the UEQ

No.	Item	1		2		3		4		5		6		7		
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Attractiveness																
1.	Troublesome Enjoyable	-	1	0.3	5	1.3	5	1.3	6	1.5	127	32.6	148	37.9	98	25.1
2.	Bad – Good			0.3	4	1.0	2	0.5	12	3.1	148	37.9	157	40.3	66	16.9
3.	Disliked Delightful	-	1	0.3	3	0.8	3	0.8	6	1.5	141	36.2	159	40.8	7	19.7
4.	Uncomfortable Comfortable	-	1	0.3	1	0.3	5	1.3	12	3.1	168	43.1	148	37.9	55	14.1
5.	Unattractive Attractive	-	3	0.8	3	0.8	5	1.3	23	5.9	167	42.8	122	31.3	67	17.2
6.	Unfriendly – User- friendly		1	0.3	3	0.8	3	0.8	20	5.1	176	45.1	119	30.5	68	17.4
Perspectuity																
1.	Incomprehensible – Understandable		1	0.3	4	1.0	4	1.0	9	2.3	136	34.9	165	42.3	71	18.2
2.	Difficult to learn – Easy to learn		1	0.3	9	2.3	5	1.3	17	4.4	157	40.3	132	33.8	69	17.7
3.	Complicated Simple	-	1	0.3	2	0.5	11	2.8	8	2.1	115	29.5	187	47.9	66	16.9
4.	Confusing – Clear		1	0.3	3	0.8	5	1.3	17	4.4	141	36.2	147	37.7	76	19.5
Efficiency																
1.	Slow – Fast		1	0.3	2	0.5	5	1.3	14	3.6	149	38.2	160	41.0	59	15.1
2.	Inefficient Efficient	-	1	0.3	1	0.3	3	0.8	18	4.6	141	36.2	176	45.1	50	12.8
3.	Impractical Practical	-	1	0.3	3	0.8	4	1.0	11	2.8	133	34.1	179	45.9	59	15.1
4.	Messy – Organized		3	0.8	4	1.0	4	1.0	21	5.4	164	42.1	122	31.3	72	18.5
Dependability																
1.	Unpredictable Predictable	-	1	0.3	4	1.0	9	2.3	34	8.7	135	34.6	148	37.9	59	15.1
2.	Obstructive Supportive	-	2	0.5	12	3.1	12	3.1	12	3.1	129	33.1	162	41.5	61	15.6
3.	Unsafe – Safe		2	0.5	2	0.5	5	1.3	17	4.4	154	39.5	133	34.1	77	19.7

Dependability																
4.	Does not meet expectations - Meets expectations	1	0.3	3	0.8	2	0.5	29	7.4	182	46.7	116	29.7	57	14.6	
Stimulation																
1.	Useless - Useful	2	0.5	3	0.8	2	0.5	17	4.4	154	39.5	128	32.8	84	21.5	
2.	Boring - Enjoyable	1	0.3	6	1.5	7	1.8	13	3.3	117	30.0	181	46.4	65	16.7	
3.	Unattractive - Attractive	-	1	0.3	2	0.5	4	1.0	11	2.8	140	35.9	177	45.4	55	14.1
4.	Demotivating - Motivating	-	1	0.3	2	0.5	8	2.1	14	3.6	151	38.7	149	38.2	65	16.7
Novelty																
1.	Monotonous - Creative	-	1	0.3	2	0.5	7	1.8	20	5.1	159	40.8	145	37.2	56	14.4
2.	Conventional - Inventive	-	1	0.3	7	1.8	9	2.3	27	6.9	149	38.2	134	34.4	63	16.2
3.	Commonplace - Leading	-	6	1.5	31	7.9	18	4.6	32	8.2	136	34.9	111	28.5	56	14.4
4.	Conservative - Innovative	-	4	1.0	14	3.6	29	7.4	47	12.1	104	26.7	141	36.2	51	13.1

The average scores for each UEQ dimension are presented in Table 6, while their visual representation is shown as a benchmark in Figure 4.

Table 6. Average UEQ Scores for the HalloBumil Application

Dimension	Mean	Evaluation of Assessment
<i>Attractiveness</i>	1,6	Positive
<i>Perspicuity</i>	1,7	Positive
<i>Efficiency</i>	1,6	Positive
<i>Dependability</i>	1,5	Positive
<i>Stimulation</i>	1,7	Positive
<i>Novelty</i>	1,3	Positive

Table 6 shows that, overall, the UEQ assessment scores fall within the positive range, with the highest means observed in the Perspicuity (1.7) and Stimulation (1.7) dimensions. This finding is consistent with the benchmark presented in Figure 4. The dimensions of Attractiveness, Efficiency, Dependability, Stimulation, and Novelty indicate that all variables fall within the "good" category, while the Perspicuity dimension falls into the Above Average category.

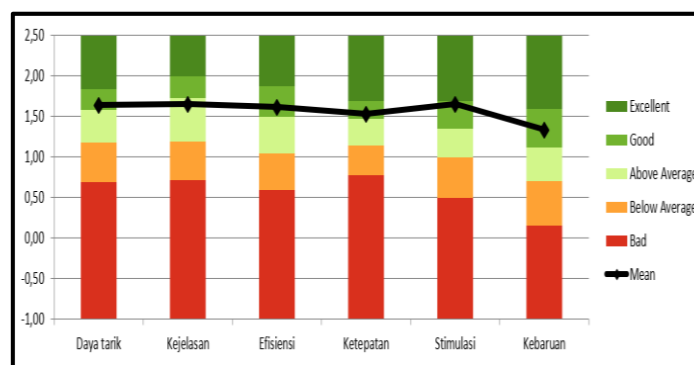


Figure 4. UEQ Benchmark of the Hallobumil Application

Discussion

System Usability Scale

Based on the analysis of 390 respondents, the average SUS score for the Hallobumil application was 62. This score was calculated by summing each respondent's SUS item scores and multiplying by 2.5, following Brooke's (1996) procedure. This value places the application in the marginal acceptability category, with a grade of D and an adjective rating of "OK." In other words, the application is usable but not yet optimal. This condition aligns with Weichbroth (2025), who noted that many mobile applications fall within the marginal zone—functionally usable, but still requiring improvements in navigation, efficiency, and design. (Weichbroth, 2025) This score is also still below the global average SUS score of 68. (Faizza Zainuddin et al., 2025).

These results are consistent with the study by Wulandari et al. (2022) on the Oncodoc m-health application, which obtained a SUS score of 70.88 (acceptable). According to the SUS categorization, scores between 51 and 70.9 are considered marginal, while scores above 71 are classified as acceptable (Wulandari et al., 2022). This indicates that Hallobumil still requires further development to reach the acceptable category. The study by Putra et al. (2020) also emphasized that learnability and minimal errors play a significant role in user satisfaction. This finding aligns with Hallobumil, where the majority of respondents did not experience significant difficulties and reported being fairly satisfied (Kushendriawan et al., 2021).

In detail, the learnability aspect is fairly good, as 72.3% of respondents stated that the application is easy to use, and 69.5% did not feel confused. The efficiency aspect is also supportive, with 69.2% of respondents considering the application not complicated and 76.9% reporting that the features functioned as intended. Regarding memorability, 76.7% of respondents felt confident that the application is easy to understand, although 66.9% indicated that they needed some time to adapt before using it smoothly. In terms of errors, 54.4% of respondents did not require technical assistance, and 72.3% did not encounter significant inconsistencies. Finally, satisfaction is relatively high, as 76.4% intend to use the application again, and 78.5% felt unimpeded while using it.

Nevertheless, 26.2% of respondents still required assistance, and the majority (66.9%) reported needing adaptation time. This indicates the need for better guidance and technical support. With a score of 62, Hallobumil meets the basic user needs but remains in the marginal category. Therefore, further development is required to reach the acceptable category and provide a more satisfying user experience.

User Experience

Based on the analysis using the User Experience Questionnaire (UEQ), the six measured variables Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty obtained positive mean scores: Attractiveness 1.6; Perspicuity 1.7; Efficiency 1.6; Dependability 1.5; Stimulation 1.7; and Novelty 1.3. Perspicuity and Stimulation scored the highest (1.7), indicating that the application is easy to understand and provides an enjoyable user experience. This finding aligns with Lallemand, Gronier, & Koenig (2015), who emphasized the importance of clarity and stimulation in shaping a positive user experience (Lallemand et al., 2015).

Overall, all scores are above 0.8, thus classified as positive baik (Schrepp, 2016). The UEQ benchmark indicates that the Hallobumil indicators fall into the Good category, except for Perspicuity, which is classified as Above Average ("Analisis User Experience Pada Tiktok Menggunakan Metode User Experience Questionnaire (UEQ)," 2022). Although Novelty scored the lowest among the dimensions (1.3), it still falls within the "Good" category. This is consistent with the observation that the novelty dimension in many digital applications tends to be relatively low. Schrepp, Hinderks, & Thomaschewski (2017), in *User Experience Questionnaire (UEQ): Current State and Development*, stated that UEQ scores above 0.8 indicate a positive and satisfying user experience. Nevertheless, Novelty remains an important differentiating aspect, and the development of new features is still necessary to make the application more innovative. (Schrepp et al., 2017).

In more detail, Attractiveness (1.6) indicates that the application is perceived as appealing and enjoyable. Perspicuity (1.7) reflects that the application is easy to understand with an intuitive interface. Efficiency (1.6) suggests that users can complete tasks easily and effectively. Dependability (1.5) shows that the application is fairly reliable and trustworthy in providing health information. Stimulation (1.7) emphasizes that the application provides an experience that motivates users. Novelty (1.3) indicates limited innovation, which aligns with Lestari et al. (2023), who found that many housewives tend to use smartphones primarily for entertainment and communication (Lestari et al., 2023). Based on the data analysis using the UEQ instrument, the average scores of each indicator represent respondents' perceptions of the user experience of the Hallobumil application (Prayoga et al., n.d.).

These findings are consistent with the study by Handasari et al. (2024) on the JKN Mobile application, which also utilized the UEQ (Handasari et al., 2024). The results indicate that, although the average scores are positive (>0.8), the Novelty aspect received the lowest score (0.6). This emphasizes that feature novelty



remains a major challenge in the development of health applications in Indonesia, including Hallobumil.

Conclusion

Based on the analysis using the SUS and UEQ methods, the Hallobumil application obtained an average SUS score of 62, which falls into the marginal category (Grade D, adjective rating "OK"). The UEQ measurements indicated positive scores across all dimensions: Attractiveness (1.6), Perspicuity (1.7), Efficiency (1.6), Dependability (1.5), Stimulation (1.7), and Novelty (1.3). Overall, the Hallobumil application is considered sufficiently suitable as a digital medium to support pregnancy, although further development is needed, particularly in the aspects of novelty and improving ease of use.

Author Contributions

AZ was responsible for conceptualizing the study, collecting data, analyzing data, writing the article, and translating the article. RW contributed to writing the article, guiding the research from start to finish, and internally reviewing the article.

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Institutional Review Board Statement

This study has obtained ethical clearance from the Ethics Committee of Universitas Dian Nuswantoro, with letter number: 01/EA/KEPK-FIKES/I/2025.

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Conflicts of Interest:

All authors declare that there are no conflicts of interest.

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