

Received : Dec 12, 2023
Accepted : Dec 20, 2023
Published : Mar 28, 2024

**Conference on Management, Business,
Innovation, Education and Social Science**
<https://journal.uib.ac.id/index.php/combines>

Implementation of the MDLC Method in Designing 2D Animation About Menstruation for Adolescent Girl

Bayu Syahputra¹, Deli², Christine Gabriella³

Email of author correspondence : bayu@uib.ac.id

¹Faculty of Computer Science, Batam International University, Batam, Indonesia

²Faculty of Computer Science, Batam International University, Batam, Indonesia

³Faculty of Computer Science, Batam International University, Batam, Indonesia

Abstract

Puberty in teenage girls is usually marked by menarche or first menstruation. There are several factors that cause abnormal menstrual cycles such as stress, nutritional problems, hormonal disorders and also chronic diseases. Knowledge and insight about menstruation is very important in the growth and development of a woman. By designing a 2D animated video about menstruation, we can provide information to young women. The method that will be used for data collection is by interviewing experts in the field and the method used in designing 2D animation video is MDLC (Multimedia Development Life Cycle). The result of this research is a 2D animated video entitled "What is Menstruation?" as a medium of information.

Keywords:

2D Animation, MDLC, Menstruation

Introduction

This period of physical and mental changes that occur in boys and girls cannot be avoided by all teenagers. These changes during puberty are caused by hormonal changes. Puberty in adolescent girls is formed by menarche (first menstruation) which generally appears at the age of 11-15 years (Maedy et al., 2022).

Menstruation is a process where blood comes out through the vagina due to the shedding of the lining of the uterine wall (Zubaidah, 2021). In general, normal menstruation lasts around 3 – 7 days and the total menstrual blood released is under 80 ml (Lestari et al., 2023).

The menstrual cycle is usually calculated from the first day of menstruation to the first day of the next menstruation and if the menstrual cycle pattern that occurs in a woman is not less than 21 days and does not exceed 31 days, then it can be said to be a normal menstrual cycle (M. M. Gultom et al., 2021). Irregular menstrual cycles, excessive pain, excessive bleeding and long menstrual periods can be said to be menstrual disorders (Silalahi, 2021).

Several factors cause irregular menstrual cycles such as stress, anxiety, life pressure, physical and psychological fatigue, hormonal disorders, nutritional status, and chronic diseases

(Silalahi, 2021). The role of nutritional status is an important role in achieving optimal health and if the condition of nutritional intake is less than the body's needs, it will have an impact on poor nutritional status and vice versa (Maedy et al., 2022).

Stress is also a psychological factor that causes irregular menstrual cycles. The hormone produced by stress, namely the hormone cortisol, will cause an imbalance in reproductive hormones, if that happens it will have an impact on the menstrual cycle (Rahma, 2021).

Personal hygiene during menstruation is an effort to maintain personal hygiene and genital organs. The bad impact that will occur if a woman's personal hygiene is not maintained is the risk of developing cervical cancer due to infections that occur in the reproductive tract (Triamanda et al., 2022).

One effort to provide information about menstruation to young women is by using animation media. Animation presents a collection of images that are assembled and arranged sequentially at a certain speed so that they appear to be moving (Rondonuwu et al., 2022).

Literature Review

Research by (Krisciaputri & Wenas, 2021) designed an outreach video entitled Menstrual Health and Hygiene using motion graphic techniques which were able to convey information regarding the cleanliness and health of women's reproductive organs during menstruation properly. With the information conveyed, knowledge will influence a person's behavior according to their behavior.

In research by (Saputri, 2022) entitled "The Effectiveness of Interactive Multimedia in Increasing Knowledge of Menstrual Physiology of Semester I DIII Female Students, Ministry of Health SURAKARTA POLTEKKES" explained that by using interactive multimedia media, information is easier to understand because there are pictures that can help with imagination.

Research by (R. F. B. Gultom et al., 2023) also explained that the results of a survey using audiovisual animation media had a significant effect on the behavior and knowledge of teenage girls regarding maintaining cleanliness during menstruation. And 80% of students stated that audiovisual media makes it easier to understand.

Research by (Fajrin, 2022) used qualitative data collection methods, interviews. By conducting interviews with experts who are competent in the field of female reproductive organs, the data collected will be analyzed and obtain more specific results.

Research conducted by (Pratama & Julianto, 2022) regarding the design of documentary videos for coconut derivative export products using the MDLC (Multimedia Development Life Cycle) method. The method used is suitable for designing or developing a multimedia work. The results of the documentary video are also designed based on the plot and concepts that have been designed.

This research will be carried out with the aim of providing information to young women as in research conducted by (Krisciaputri & Wenas, 2021). Then research was conducted (R. F. B. Gultom et al., 2023; Saputri, 2022) which stated that using animation can make it easier for young women to understand the material presented. This research was also carried out by collecting qualitative data using the interview method as in research (Fajrin, 2022). By using the MDLC (Multi-media Development Life Cycle) method as in research conducted by (Pratama & Julianto, 2022).

Research Methods

In this research, data collection will be carried out using an interview method with experts in the field of menstruation. Interviews will be conducted online or offline according to the expert's schedule. The interview process will be carried out with an obgyn doctor. The purpose of the interview is to obtain information about menstruation which will then be processed and applied to the design of 2D animated video content.

In the video design process, the MDLC or Multimedia Development Life Cycle method will be used. By using this method, the first thing that must be completed is designing the concept before carrying out the next stages (Syahputra, 2022). The stages in MDLC are as follows.

1. Concept

In the initial stage, namely the concept, the author will determine the type of video to design and also look for several reference videos that can help in the design process.

2. Design

At this stage, a storyboard will be designed which aims to illustrate the final result of the 2D animated video. The storyboard also describes each scene to make it easier to understand during design process.

3. Data collection

At this stage, data will be collected using an interview method with a doctor who are experts in the field of female reproductive organs to obtain the data needed to make a 2D animated video.

4. Manufacturing

At this stage the video will be designed according to the storyboard that has been designed. The software that will be used in designing this 2D animated video is Adobe Illustrator 2021, Adobe Audition 2023, Adobe Animate 2022, and Adobe After Effects 2021.

5. Testing

At the testing stage, the author will test the animated video that has been designed. If there are errors, corrections will be made before distribution.

6. Distribution

After passing the testing stage, the animated video is suitable for distribution.

Results and Discussion

In this research, the first stage carried out was data collection using the interview method. Data collection was carried out by interviewing Dr. Gina FA Rotty, Sp.Og to collect information about menstruation. From interview with Dr. Gina FA Rotty, Sp.Og, the following data was obtained.

1. Menstruation is a physiological change in a woman's body that occurs every month and is influenced by reproductive hormones such as estrogen and progesterone. Menstruation also occurs in other large animals, while other mammals experience the estrus cycle. So menstruation is a natural cycle that occurs in the female reproductive organs which is marked by the release of blood from the cervix where the blood comes from the shedding of the lining of the uterus without fertilization occurring.

2. Menstruation generally begins in adolescents aged 9 to 12 years old and lasts until the age of 45 to 55 years old. Usually the menstrual cycle is 24 to 35 days apart and the menstrual period lasts 3-7 days. The phases in the menstrual cycle, namely, the menstrual phase which lasts 3-7 days, the pre-ovulation phase which is the period of the process of maturation of the

ovum in the ovaries which is caused by an increase in estrogen levels in the body, the ovulation phase which is the time when the egg cells are mature and ready to be fertilized by spermatozoa in the fallopian tubes, and the last is the luteal phase where the egg has turned into a corpus luteum and released reproductive hormones, usually lasts 11-17 days and often causes PMS symptoms.

3. The hormones that contribute to the menstrual process are progesterone, estrogen, gonadotropin, luteinizing and follicle hormones.

4. General symptoms that occur during menstruation such as mood swings, increased emotions, headaches, facial acne, increased appetite and menstrual pain.

5. Menstrual pain or dysmenorrhea has 2 types, namely primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is usually the term used for menstrual pain that is not related to a physical cause, while secondary dysmenorrhea is one that is related to a physical cause. There are several factors that cause menstrual pain, namely due to uterine contractions or ischemia of the uterine muscles, an imbalance of the hormones estrogen and progesterone, and psychological or excessive anxiety.

6. There are several efforts that can be made to treat menstrual pain, namely by doing warm compresses, stretching the ligament muscles to improve blood flow, taking painkillers, and consulting a doctor if the pain is excessive because there may be reproductive disorders.

7. There are also 3 types of menstrual disorders, namely very heavy menstruation or menorrhagia, irregular menstruation or oligomenorrhea, and not having menstruation or amenorrhea.

8. PMS or Premenstrual syndrome is a syndrome characterized by symptoms experienced by women before entering the menstrual period. PMS usually occurs about 1-2 weeks before menstruation and the severity of each individual is also different. Factors that are thought to trigger PMS include hormonal changes and changes in chemicals in the brain.

9. Some of the symptoms experienced during PMS are breast pain, weight gain, headaches, muscle aches, stomach cramps, acne, diarrhea, fatigue, difficulty concentrating, irritability, crying for no reason, restlessness, overuse, insomnia, and depression. If the PMS symptoms you experience interfere with your daily activities, it is recommended that you undergo an examination or consult a doctor.

10. There are several personal hygiene and health things that need to be considered during menstruation, such as regularly changing sanitary napkins, cleaning the genital area regularly and using underwear that absorbs sweat.

The following are questions asked during the interview.

Table 1. Question for the interview

No	Question
1	What is menstruation?
2	How can it be said that menstruation is normal and what are the signs of abnormal menstruation?
3	How many days does the menstrual cycle usually last and how can an abnormal menstrual cycle occur?
4	How can you prevent abnormal menstruation from occurring?
5	What personal hygiene needs to be considered during menstruation?
6	How bad do menstrual symptoms or disorders have to be to warrant a visit to the doctor?

In designing this 2D animated video using the MDLC method which consists of the following stages.

1. Concept

In determining the concept for designing this animated video, several video references from YouTube were searched. By doing this search, it will be easier to have an initial idea of the form of animation you want to design.

2. Design

At this stage, a storyboard will be designed which will function as an illustration of the design process and a picture of the expected final video result. The following are the results of the storyboard that has been designed.

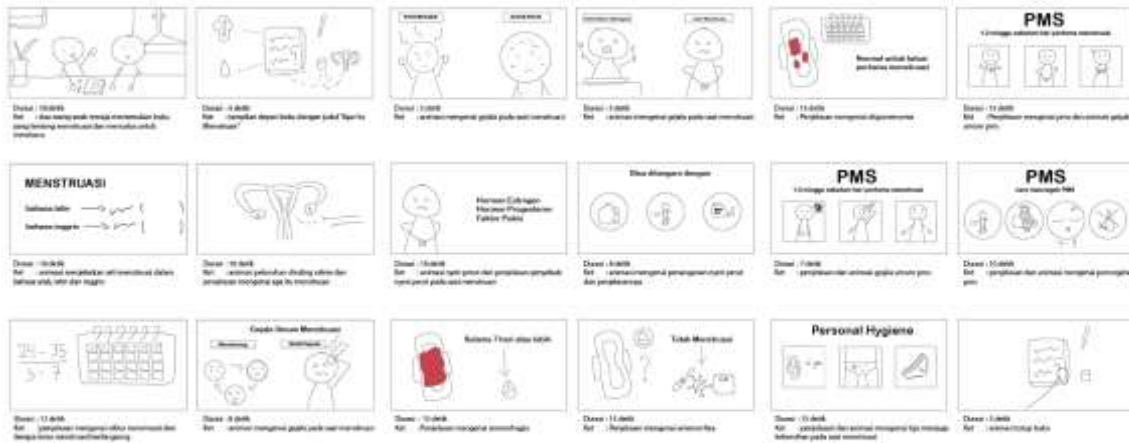


Figure 1. Storyboard

3. Data collection

Then it will collect the data needed to design the video, such as the narrator audio and the required content. The animated characters will be designed using Adobe Illustrator 2021 and the background sound for the video will use audio downloaded from the internet where the song is copyright free.

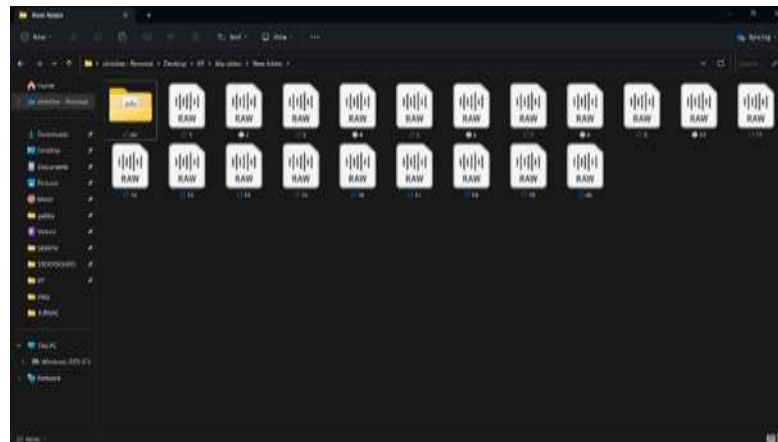


Figure 2. Collected Audio

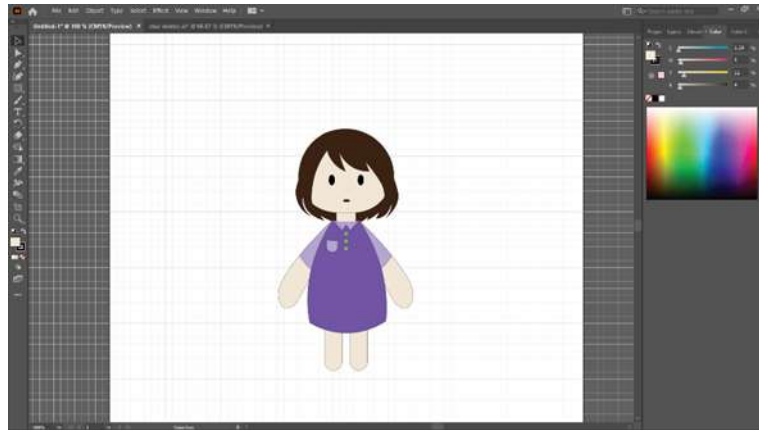


Figure 3. Character Design

4. Manufacturing

After collecting all the required media, an animated video will be designed. The application used for the animation process is Adobe Animate 2022. Then for the narrator audio which has noise, noise reduction will be carried out using Adobe Audition 2023. For explanatory text in the animated video will be using Arial Rounded MT Bold font.

The following is a display of the 2D animated video that has been created.



Figure 4. Scene 1

The first scene will show two teenage girls who find a book entitled "What is Menstruation?"



Figure 5. Scene 2

In the second scene, a book will be displayed on a table and images of sanitary napkins, blood and vaginas will appear.



Figure 6. Scene 3

Then the next scene is an explanation of menstruation in Latin and English with a Fade in Fade out transition.



Figure 7. Scene 4

The next scene will show the shedding of blood on the vaginal walls and with narrator audio.

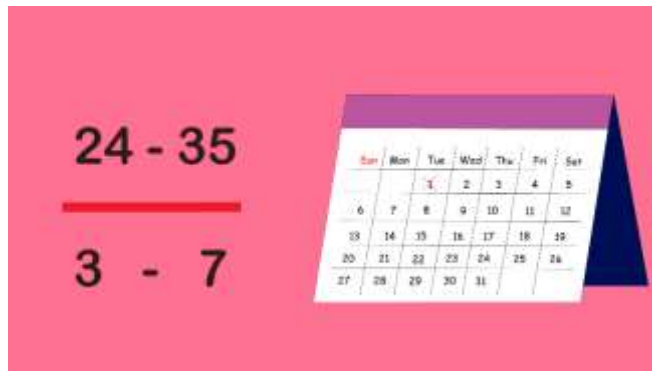


Figure 8. Scene 5

The next scene is a calendar that marks the menstrual period and will explain the menstrual cycle in women.



Figure 9. Scene 6

In this scene, the general symptoms of menstrual mood swings and headaches will be shown by writing explanatory text using the Arial Rounded MT Bold font.



Figure 10. Scene 7

The following scene will show the general symptoms of menstruation, increased emotions and acne on the face by writing explanatory text using Arial Rounded MT Bold font.



Figure 11. Scene 8

Then the following scene will show the general symptoms of menstruation, increased appetite and menstrual pain by writing explanatory text using Arial Rounded MT Bold font.

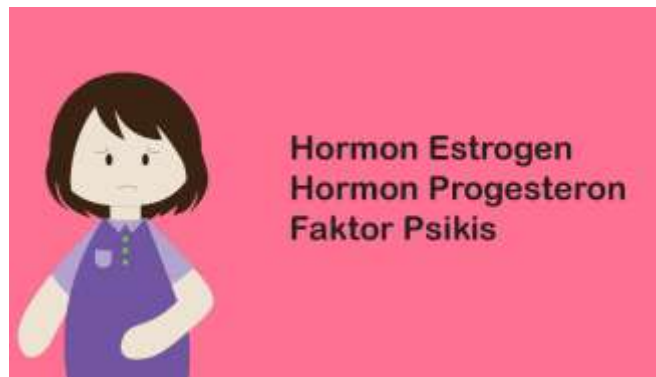


Figure 12. Scene 9

After that, we will enter the menstrual pain scene where the causes of menstrual pain will be explained and explanatory text will be written in Arial Rounded MT Bold font.



Figure 13. Scene 10

This scene will show how to treat menstrual pain with narrator audio.



Figure 14. Scene 11

The next scene will explain about heavy menstruation and what it can cause. Writing the explanatory text uses the Arial Rounded MT Bold font.



Figure 15. Scene 12

The next scene will explain the absence of menstruation and its causes.



Figure 16. Scene 13

The next scene is an explanation about irregular menstruation and there is an narrator audio. Then the explanatory text uses the Arial Rounded MT Bold font.



Figure 17. Scene 14

The next scene explains about PMS and the symptoms experienced during PMS.



Figure 18. Scene 15

The next scene also still shows the symptoms experienced during PMS, but with different animations and different narrator audio.



Figure 19. Scene 16

After that, a scene will show how to prevent PMS with an narrator audio.



Figure 20. Scene 17

Then we will go into an explanation of personal hygiene during menstruation.



Figure 21. Scene 18

The following is the final display of the animation, namely the closing of the book and an explanation audio reminding you that menstruation is normal and don't be embarrassed to consult a doctor.

5. Testing

Based on data obtained from Dr. Gina FA Rotty, the author designed a 2D animated video using this data. The results of this design will be tested by Dr. Hengky Fernando, Sp.Og and obtained the following test results.

1) Explanation of menstruation, which is the process of releasing blood from the cervix which is the result of the dynamic interaction of hormones in the body in women of reproductive age which occurs periodically and cyclically. The characteristics of normal menstruation last 4-5 days, but some say 2-7 days.

2) In the explanation of the symptoms in this design only general symptoms and actually the symptoms experienced during menstruation also vary, such as increased emotions, increased appetite, menstrual pain, unfit body, flatulence, vaginal discharge, pain when urinating, unpleasant body odor and fever.

3) The explanation regarding menstrual disorders is appropriate in that it explains very heavy menstruation which is usually caused by hormonal imbalances or uterine abnormalities, irregular menstruation that occurs in the first year is considered normal, and not experiencing menstruation is most likely an abnormality in the reproductive organs.

4) A proper explanation of PMS, where PMS is a symptom experienced by women before menstruation, which usually occurs 1-2 weeks before menstruation. However, it does not explain several factors that can worsen PMS symptoms, such as having a history of depression, experiencing physical or emotional trauma, smoking and consuming alcoholic drinks, living an irregular lifestyle, rarely exercising and lack of rest time.

5) Personal hygiene shown in the 2D animation video is approved by obgyn doctor and reminds us that it is not recommended to clean the female genital area using cleaning products or medications unless prescribed by a doctor.

The following are questions to ask when conducting a testing interview.

Table 1. Question for the interview

No	Question
----	----------

1	Is the explanation about menstruation and the menstrual cycle in the 2D animated video clear and easy to understand?
2	Is the explanation of menstrual symptoms in the 2D animated video correct and easy to understand?
3	Is the explanation regarding menstrual disorders correct and easy to understand?
4	Is the explanation regarding PMS or Premenstrual Syndrome correct and easy to understand?
5	Are the explanations and displays regarding personal hygiene during menstruation correct and easy to understand?

Then the author also conducted an interview with a midwife, Mrs. Rochama Nurwati, Amd. Keb. By carrying out this second test, the results were obtained in the form of a 2D animated video which was designed to convey information clearly and easily understood, then the information conveyed was precise and correct. The audio and video display also uses colors and appearances that are attractive to young women, and the use of background music does not cover the voice of the narrator who is explaining the contents of the video.

The following are the questions asked.

Table 1. Question for the interview

No	Question
1	Does this 2D animated video about menstruation succeed in conveying good and easy-to-understand information?
2	Is the audio presentation and video display in this 2D animated video interesting?
3	Is the background music in the 2D animated video appropriate?

6. Distribution

After passing the testing stage, a 2D animated video about menstruation for young women will be published to the public. The results of this video will be uploaded to video publication platforms such as YouTube.

Conclusions

Some conclusions obtained from this research are as follows.

- 1) Designing information media in the form of 2D animation can make conveying information easier and easier to understand.
- 2) Menstruation is important in the development of a woman's body, so knowledge and insight about menstruation is something that is needed by young women.
- 3) This research is recommended for future researchers to carry out further development and design of audiovisual media regarding menstruation as an information medium.

References

- Fajrin, Y. A. (2022). Perancangan Buku Ilustrasi Menstruasi Sebagai Media Edukasi Untuk Remaja Perempuan. *DeKaVe*, 15(1), 54–61. <https://doi.org/10.24821/dkv.v15i1.6343>
- Gultom, M. M., Fitriangga, A., & Ilmiawan, M. I. (2021). Hubungan Indeks Massa Tubuh dan Usia Menarche dengan Pola Siklus Menstruasi Siswi SMA di Pontianak. *Cermin Dunia Kedokteran*, 48(12), 696. <https://doi.org/10.55175/cdk.v48i12.1573>
- Gultom, R. F. B., Khoiriyah, F., Hidayati, Y., & Nainggolan, W. E. (2023). PENGARUH PENDIDIKAN KESEHATAN DENGAN MEDIA ANIMASI TENTANG PERSONAL HYGIENE TERHADAP PERILAKU REMAJA PUTRI SAAT MENSTRUASI. *Midwifery: Jurnal Kebidanan Dan Sains*, 1(2 SE-Artikel), 47–51.

- Krisciaputri, Y. C. I., & Wenas, M. B. (2021). Edukasi Perawatan Organ Reproduksi Eksternal Saat Menstruasi Bagi Remaja Putri Melalui Video Animasi Tipe Motion Graphic. *Jurnal Bahasa Rupa*, 4(2), 87–100. <https://doi.org/10.31598/bahasarupa.v4i2.472>
- Lestari, T. A., Mumpunni, R. Y., & Sari, N. L. S. (2023). Literatur Review: Hubungan Tingkat Stres dengan Gangguan Siklus Menstruasi pada Mahasiswa Usia 18-25 Tahun. *Profesional Health Journal*, 4(2sp), 1–7.
- Maedy, F. S., Permatasari, T. A. E., & Sugiatmi, S. (2022). Hubungan Status Gizi dan Stres terhadap Siklus Menstruasi Remaja Putri di Indonesia. *Muhammadiyah Journal of Nutrition and Food Science (MJNF)*, 3(1), 1. <https://doi.org/10.24853/mjnf.3.1.1-10>
- Pratama, J., & Julianto, J. (2022). PERANCANGAN DAN ANALISIS VIDEO DOKUMENTER PRODUK EKSPOR TURUNAN KELAPA DENGAN METODE MDLC. *JURSIMA (Jurnal Sistem Informasi Dan Manajemen)*, 10(3), 227–238.
- Rahma, B. (2021). Hubungan Kebiasaan Konsumsi Fast Food Dan Stres Terhadap Siklus Menstruasi Pada Remaja Putri Sman 12 Kota Bekasi. *Jurnal Health Sains*, 2(4), 432–443. <https://doi.org/10.46799/jhs.v2i4.151>
- Rondonuwu, S. N. N. D., Sumayku, J., & Takaredase, A. (2022). Penerapan Metode Pembelajaran Demonstrasi Untuk Meningkatkan Hasil Belajar Animasi 2D pada Siswa SMK. *EduTik : Jurnal Pendidikan Teknologi Informasi Dan Komunikasi*, 2(2), 205–211. <https://doi.org/10.53682/edutik.v2i2.4553>
- Saputri, N. A. S. (2022). EFEKTIVITAS MULTIMEDIA INTERAKTIF DALAM MENINGKATKAN PENGETAHUAN FISILOGI MENSTRUASI MAHASISWI SEMESTER I DIII KEBIDANAN POLTEKKES KEMENKES SURAKARTA. *JOEL: Journal of Educational and Language Research*, 1(7 SE-Articles), 745–754. <https://doi.org/10.53625/joel.v1i7.1467>
- Silalahi, V. (2021). Hubungan Tingkat Kecemasan Dengan Siklus Menstruasi Pada Mahasiswi Tingkat Akhir. *Jurnal Kesehatan Mercusuar*, 4(2), 1–10. <https://doi.org/10.36984/jkm.v4i2.213>
- Syahputra, B. (2022). Pengembangan Videografi Makanan di Pasar Malam Taiwan Berbasis Research and Development. *Journal of Information System and Technology*, 3(3), 28. <https://doi.org/10.37253/joint.v3i3.7330>
- Triamanda, R. Z., Salawati, T., & Larasaty, N. D. (2022). Pengembangan Konten Video Animasi Motion Graphic Sebagai Media Promosi Kesehatan Personal Hygiene Menstruasi Bagi Remaja Putri. *Jurna I Cakrawala Promkes*, 4(1), 40–52.
- Zubaidah, Z. (2021). Perilaku Remaja Putri Dalam Pelaksanaan Kebersihan Genitalia Saat Menstruasi Di Desa Krayan Bahagia. *Jurnal Ilmu Kesehatan Insan Sehat*, 9(1), 1–4. <https://doi.org/10.54004/jikis.v9i1.14>