

Implementation of Multimedia Development Life Cycle in Short Film Production: A Case Study of “Bipol in Love”

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Abstract. The development of multimedia technology has encouraged the increasing use of short films as an effective medium for delivering information, entertainment, and social messages. This study aims to analyze the implementation of the Multimedia Development Life Cycle (MDLC) method in the production process of the short film “Bipol in Love.” The film tells the story of student life and romance inspired by the Bus Poltek transportation facility at Politeknik Negeri Jakarta. This research applied a qualitative creation-based approach using six MDLC stages: concept, design, material collecting, assembly, testing, and distribution. The concept stage determined the film objectives, target audience, and storyline, while the design stage focused on scriptwriting and storyboard creation. Material collecting involved filming and gathering multimedia assets from several locations, followed by the assembly stage using multimedia editing software to produce the final video. The testing stage was conducted through internal alpha testing to evaluate the quality of the film. The results showed that the MDLC method supported the production process of the short film “Bipol in Love” systematically and efficiently. The final output was a 16-minute and 12-second short film distributed through YouTube and promoted via Instagram. Therefore, the study concludes that the MDLC method was effective in organizing and managing the production activities of the short film “Bipol in Love.”

Keywords. Multimedia Development Life Cycle, Short Film Production, Politeknik Negeri Jakarta, Bipol

INTRODUCTION

The development of multimedia technology in the digital era has significantly influenced the creative industry, particularly in audio-visual media production such as short films (Alforova et al., 2021; Peng, 2024). Short films are considered an effective medium for delivering information (Ahmad et al., 2022), entertainment, and social messages (Putri & Parmin, 2022) because they combine visual, audio, and narrative elements into an engaging form of communication. In educational institutions, multimedia-based film production is also widely utilized as a practical implementation of students' competencies in cinematography, video editing, storytelling, and multimedia management (Mokalu et al., 2024). Politeknik Negeri Jakarta (PNJ), formerly known as Politeknik Universitas Indonesia/Fakultas Non-Gelar Teknologi (FNgT), is a higher education institution that emphasizes a balance between theoretical and practical learning. PNJ implements a curriculum composition of 40% theory and 60% practice to prepare students with technical and professional competencies aligned with industry demands.

As part of its practical learning approach, students are encouraged to develop multimedia projects that integrate creativity, technology, and communication skills (Politeknik Negeri Jakarta, 2021b).

One of the supporting facilities available at PNJ is the Bus Poltek (Bipol) transportation unit, which serves as a campus transportation system connecting several areas within the Universitas Indonesia and PNJ environments (Politeknik Negeri Jakarta, 2021a). The existence of this transportation facility inspired the creation of the short film "*Bipol in Love*." The film tells the story of two students, Sonia and Bram, whose relationship begins through their encounters on the Bipol during their daily campus activities. Through a romantic and emotional narrative, the film conveys moral values regarding communication, patience, honesty, and unexpected encounters in everyday life. The film was selected as the case study because it represents a complete multimedia production project involving all stages of filmmaking, from pre-production and production to post-production, testing, and distribution. In addition, the entire production process was systematically documented, making it suitable for analyzing the implementation of the Multimedia Development Life Cycle (MDLC) method in a real multimedia production environment. The production of multimedia works such as short films requires a systematic development method to ensure that each production stage is carried out effectively and efficiently.

One of the concepts widely adopted in multimedia development is the Multimedia Development Life Cycle (MDLC), which was introduced by Luther and later refined by Sutopo. MDLC provides a systematic framework for developing multimedia products through a sequence of structured activities, enabling developers to organize the production process from planning to final delivery. As a multimedia development model, MDLC consists of six stages: concept, design, material collecting, assembly, testing, and distribution. In this study, the MDLC concept was implemented as the development method to analyze the production process of the short film *Bipol in Love*, because its structured stages are suitable for managing multimedia production activities from pre-production to distribution (Syam et al., 2024).

Several previous studies have discussed the implementation of MDLC and cinematographic techniques in short film production. Pambudi et al. (2025) produced a documentary film entitled "*Dari Ucapan, ke Hati, dan Menjadi Rasa*" to portray social life in the PNJ cafeteria using the MDLC method. Their study demonstrated that documentary films can effectively communicate social values through visual storytelling and achieved positive audience responses through alpha and beta testing evaluations. Furthermore, Hutagalung et al. (2024) focused on the implementation of cinematography and color grading techniques in the short film "*Demi Cinta*," emphasizing the enhancement of visual aesthetics and emotional atmosphere through cinematic principles and editing techniques. Meanwhile, Maulana et al. (2025) developed the short film "*Berbagi Asa*" using the MDLC method combined with color grading techniques to create a more professional and visually appealing promotional film. Although previous studies have discussed multimedia development methods and cinematic techniques in short film production, most of them focused on documentary films, promotional films, or visual enhancement techniques such as cinematography and color grading. Research specifically discussing the implementation of MDLC in the production process of a narrative romantic short film inspired by campus transportation culture remains limited. Therefore, this study aims to analyze and implement the Multimedia Development Life Cycle method in the production of the short film "*Bipol in Love*."

The novelty of this research lies in the analysis of the Multimedia Development Life Cycle (MDLC) implementation in the production of a campus-themed romantic short film that integrates the Bipol transportation culture with moral values related to communication, patience, honesty, and unexpected encounters in students' daily lives. Unlike previous studies that primarily focused on documentary films, promotional films, or cinematographic techniques, this study demonstrates how each MDLC stage supports the systematic development of a narrative short film from pre-production to distribution. In addition, this research provides practical insights into the application of MDLC in

managing multimedia production activities within an educational context. Therefore, this research is expected to contribute both academically and practically to the field of multimedia production and short film development.

METHODS

This study employed the Multimedia Development Life Cycle (MDLC) as the research method to analyze the production process of the short film *"Bipol in Love."* The research adopted a qualitative creation-based approach, focusing on documenting and analyzing each stage of multimedia production. The implementation of MDLC in this study consisted of six stages: concept, design, material collecting, assembly, testing, and distribution. Data were collected through observation, documentation, and audiovisual recordings throughout the production process. The collected data were then analyzed descriptively to examine how each MDLC stage was implemented during the development of the short film, from the initial concept to the final distribution process.

The data sources used in this study consist of primary and secondary data. Primary data were obtained through direct observation during the production activities, including script preparation, storyboard creation, filming, editing, and internal evaluation. Secondary data were collected from journals, articles, previous studies, and documentation related to multimedia production, cinematography, and the implementation of MDLC in film production. Data collection techniques used in this study include observation, documentation, and audiovisual recording. Documentation techniques were used to collect production materials such as scripts, storyboards, production schedules, and editing files, while audiovisual recording was carried out during the filming process to gather the footage used in the final production.

The implementation of the Multimedia Development Life Cycle (MDLC) in this study began with the concept stage, where the production team determined the film concept, objectives, target audience, and final output. The next stage was the design stage, which involved developing the script and storyboard as visual and narrative guidelines for the production process. The script was created to organize the storyline, dialogues, and moral messages conveyed in the film, while the storyboard was designed to visualize scenes, camera angles, shot compositions, and filming sequences. After the design stage, the process continued with material collecting, where all multimedia assets required for the production were gathered. This stage included filming activities to obtain video footage, audio recordings, and supporting visual materials in several locations, including the PNJ campus area, Universitas Indonesia, and Stasiun Pondok Cina, according to the scenes planned in the storyboard and script.

The collected materials were then processed in the assembly stage by combining and editing all footage into a complete short film. The editing process involved video cutting, scene arrangement, audio synchronization, color adjustment, transition effects, subtitle insertion, and background music editing using multimedia software such as Adobe Premiere Pro and Adobe After Effects to produce a coherent and visually appealing final video. After the editing process was completed, the film entered the testing stage, where alpha testing was conducted internally to identify technical errors and evaluate the quality of the film. Alpha testing was conducted collaboratively by 10 production team members and 1 supervisor. The production team reviewed aspects such as visual quality, storyline continuity, sound clarity, transitions, and audience understanding of the story. Feedback obtained during this stage was used to improve the final result before publication. The final stage of the MDLC process was distribution, where the completed short film *"Bipol in Love"* was uploaded and distributed through the YouTube platform to enable public access and broader audience engagement. Overall, the research flow implemented in this

study consists of six stages: Concept, Design, Material Collecting, Assembly, Testing, and Distribution as presented in Figure 1.

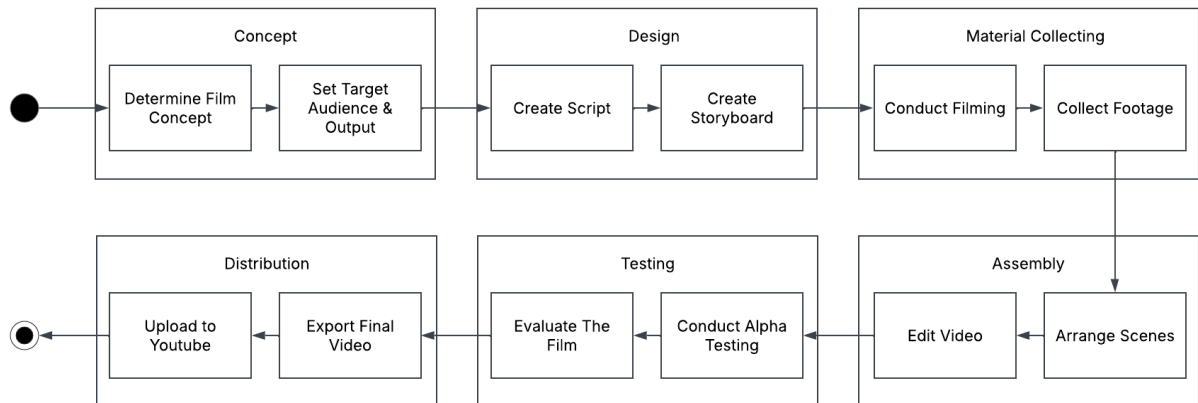


Figure 1 Research Stage

RESULTS AND DISCUSSION

1. Production Team

The production of the short film “*Bipol in Love*” involved a multidisciplinary production team responsible for various aspects of the filmmaking process, including directing, scriptwriting, art direction, cinematography, sound recording, editing, storyboard development, script continuity, and music illustration. Each team member contributed according to their assigned role to ensure that every stage of production was carried out effectively under the supervision of the project supervisor. The composition of the production team is presented in Table 1.

Table 1 Production Team of *Bipol in Love*

Role	Team Member(s)
Script Writing	Rifqy Arifin Atthallah
Research and Development	Yoseph Satria Praka
Art Director	Achmad Nur Agung
Soundman	Lidya Maharani
Cameraman	Ananda Maria, Syasya Amalia
Script Continuity	Nada Syifa Safinatun Najah
Music Illustration	Lidya Maharani, Sonia Juni Arta Simare Mare
Storyboard	Azim Rasyid Alfian, Sonia Juni Arta Simare Mare
Editor	Bramantya Destalenta, Syasya Amalia
Supervisor	Mira Rosalina

2. Concept

The concept stage is the initial stage in the Multimedia Development Life Cycle (MDLC) process that focuses on determining the main idea, objectives, target audience, output format, and storyline of the multimedia product to be developed (Novayani & Budiansyah, 2022). In this study, the concept stage was

carried out to establish the overall direction and identity of the short film “*Bipol in Love*.” The film was designed as a romantic short film inspired by student life and the use of Bipol transportation facilities at Politeknik Negeri Jakarta. The results of the concept stage are presented in Table 2.

Table 2 Concept Stage Result

Aspect	Description
Title	<i>Bipol in Love</i>
Target Audience	Minimum age of 18 years old
Output	.mp4
Duration	16 minutes 12 seconds
Platform	YouTube
Synopsis	“ <i>BIPOL IN LOVE</i> ” is a short film that tells the love story between Sonia and Bram, who meet during their journey using a public transportation service called “Bipol.” Sonia first meets Bram on Bipol while traveling to campus. The encounter leaves a deep impression on Sonia, and since then, they often meet again on various occasions.

Based on the Table 2, the short film “Bipol in Love” was designed as a campus-themed romantic narrative targeting audiences aged 18 years and above. The film was produced in MP4 format with a duration of 16 minutes and 12 seconds and was intended for distribution through YouTube. The established concept served as the primary guideline for the subsequent production stages, ensuring consistency in the storyline, production objectives, and target audience throughout the filmmaking process.

3. Design

The design stage in the Multimedia Development Life Cycle (MDLC) process focuses on preparing the visual and narrative planning before the production stage begins. In this stage, the production team created the script and storyboard as the main references for the filming process. The script is an essential component in film production because it contains the storyline, dialogues, character actions, scene descriptions, and emotional direction that guide the actors and production team during shooting activities (Admaja & Sonita, 2022). In the short film “*Bipol in Love*,” the script tells the story of Sonia, who continuously tries to approach Bram after frequently meeting him on the Bipol during their journey to campus. Sonia shows her interest and concern toward Bram, but Bram initially behaves indifferently and does not respond to Sonia’s feelings. As the story progresses, Sonia gradually stops paying attention to Bram and chooses to distance herself. At that moment, Bram slowly realizes his feelings and begins to understand the importance of Sonia’s presence in his life. The script was designed to create emotional development and romantic conflict that support the overall narrative of the film.

In addition to the script, the production team also created a storyboard as a visual guideline for the shooting process. A storyboard is a sequence of visual sketches or scene illustrations used to describe camera angles, shot compositions, scene transitions, and actor movements before filming begins. The main function of the storyboard is to help the production team visualize the scenes and ensure that the filming process runs according to the planned narrative structure (Suhendra & Ahmad, 2023). In the storyboard of “*Bipol in Love*,” each scene contains information such as cut numbers, narration, character actions, and camera directions to simplify communication among the production crew during production activities. Several storyboard scenes used in the film production are presented in Figure 2.



Figure 2 Storyboard of “Bipol in Love”

4. Material Collecting

The material collecting stage is the process of gathering all multimedia assets and production resources required for the filmmaking process. This stage includes preparing costumes, accessories, production equipment, supporting properties, filming schedules, and shooting locations. The purpose of this stage is to ensure that all materials needed during production are available and properly organized before entering the editing process.

In the production of the short film “*Bipol in Love*,” the costumes used were natural and simple, consisting of personal clothing owned by the talents to create a realistic student appearance. Several accessories were also used to support the scenes, including handphones, binder books, whiteboards and black markers, tumblers, bags, jackets, and glasses. The production equipment utilized during filming included a Fuji XA 5 camera, tripod, laptop, handphones, memory cards, card readers, lenses, and batteries. In addition, supporting equipment such as library facilities, Bus Poltek transportation, and motorcycles were also used to strengthen the visual representation of student daily life. The filming process was conducted from June 27, 2024, to July 9, 2024.

Several strategic locations were selected to support the story and visual atmosphere of the film. The production team utilized facilities at Politeknik Negeri Jakarta, including classroom AA 304, classroom GSG 203, Taman Payung, the campus canteen, Taman Elektro, and the Audio Visual Room of the library. Additional shooting locations included Danau Kenanga, Halte Menwa, and Halte Balairung at Universitas Indonesia, as well as several areas at Stasiun Pondok Cina such as the escalator, Jakarta–Bogor platform, and lobby entrance. After all materials and footage were collected, the production team organized the files into separate folders consisting of a total of 23 scenes to simplify the editing and assembly process.

5. Assembly

The assembly stage is the process of combining and editing all collected multimedia materials into a complete short film. This stage plays an important role in shaping the visual appearance, emotional atmosphere, storyline continuity, and overall quality of the film. In this process, all footage obtained during the material collecting stage was arranged and edited systematically according to the script and storyboard that had been prepared previously. The production team used computer devices with multimedia software such as Adobe Premiere Pro, Adobe After Effects, and Adobe Photoshop. Several editing techniques were applied, including color adjustment, color grading, contrast enhancement, and the use of transitions such as cut, fade in, and fade out to create smoother and more natural scene transitions. The final duration of the short film is 16 minutes and 12 seconds. Audio settings were also adjusted according to production needs through gain adjustment, level balancing, sound effects, and background

music insertion to create a more immersive and emotionally engaging visual experience. Several scenes from the editing and assembly results are presented in Figure 3.

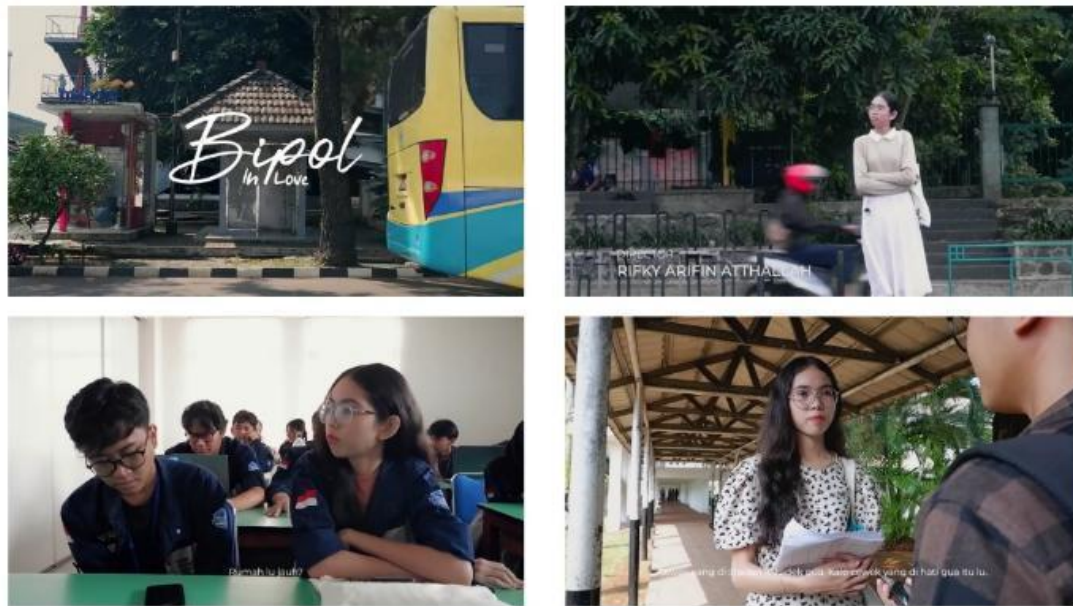


Figure 3 Assembly of “Bipol in Love”

Table 3 Alpha Testing Result

No	Evaluation Aspect	Assessment Indicator	Result	Description
1	Video Quality	Video resolution and image clarity display properly	Appropriate	The video quality appears clear and stable in all scenes
2	Audio Quality	Dialogue and background music can be heard clearly	Appropriate	Audio levels are balanced and understandable
3	Storyline Continuity	Story flow follows the script and is easy to understand	Appropriate	Scene transitions support storyline continuity well
4	Subtitle Display	Subtitles are readable and synchronized with dialogue	Appropriate	Subtitle timing and font visibility are clear
5	Scene Transition	Cut, fade in, and fade out transitions run smoothly	Appropriate	Transitions appear natural without abrupt movement
6	Color Grading	Color tones and contrast are visually consistent	Appropriate	Color adjustment supports the emotional atmosphere
7	Audio Synchronization	Audio matches the visual scenes correctly	Appropriate	No delay or mismatch between sound and video
8	Background Music	Music supports the mood and emotional scenes	Appropriate	Music selection strengthens romantic atmosphere
9	Visual Composition	Camera angles and shot compositions are appropriate	Appropriate	Visual framing follows storyboard planning
10	Character Expression	Emotional delivery of actors is understandable	Appropriate	Expressions and acting support the narrative well

6. Testing

The testing stage was conducted using alpha testing to evaluate the quality and feasibility of the short film “Bipol in Love” before the distribution process. Alpha testing is an internal evaluation method carried out by the development and production team to identify technical issues, assess visual and audio

quality, and ensure that the storyline is delivered properly to the audience. This stage is important to minimize production errors and improve the overall quality of the final multimedia product (Cahyono & Candrahutomo, 2023; Syam et al., 2024). The evaluation process focused on several aspects, including video quality, audio clarity, storyline continuity, subtitle readability, transition smoothness, color grading consistency, synchronization between audio and visuals, and overall audience understanding of the story. Each evaluator reviewed the short film and provided feedback based on the assessment indicators that had been prepared previously. The results of the alpha testing showed that all evaluated aspects met the expected production standards and were considered suitable for publication. The detailed results of the alpha testing evaluation are presented in Table 3.

Based on Table 3, the alpha testing results indicate that all evaluated aspects met the predetermined quality standards and were assessed as appropriate. The evaluation confirmed that the short film achieved satisfactory performance in terms of visual quality, audio clarity, storyline continuity, subtitle readability, scene transitions, color grading, audio synchronization, background music, visual composition, and character expression. These results indicate that the film was considered technically feasible and ready for distribution after the completion of the production process.

7. Distribution

The distribution stage is the final stage in the Multimedia Development Life Cycle (MDLC) process, where the completed multimedia product is introduced and distributed to the target audience. This stage aims to increase audience reach, promote the short film, and make the final video accessible through both online and offline media. In this study, the promotional media consisted of printed posters as the offline medium and Instagram as the online social media platform. During the distribution process of the short film *"Bipol in Love,"* printed posters were displayed on bulletin boards in several areas of the TIK Building at Politeknik Negeri Jakarta. Posters were selected as the primary offline promotional medium because they are easy to access by students, can be strategically placed in high-traffic campus locations, and effectively increase awareness among the target audience before the film's release. The poster was designed to provide information regarding the film title, visual identity, and publication platform of the short film. The promotional poster used in this study is presented in Figure 4.

In addition to offline promotion, digital promotion was also conducted through the Instagram account @bipolinlove_tik, which was used to share posters, behind-the-scenes documentation, teaser content, and film-related updates to increase audience engagement. The Instagram promotional media is shown in Figure 5.

The full version of the short film *"Bipol in Love"* was distributed through the YouTube platform to allow broader public access and easier viewing. The film can be accessed through YouTube Link of Bipol in Love, s.pnj.ac.id/BipolInLove. Through both offline and online distribution strategies, the production team aimed to maximize audience reach and introduce the short film to students and the wider community.

Based on Figures 4, 5 and 6, the distribution stage was implemented through an integrated offline and online promotion strategy. Printed posters were used to increase awareness among students within the campus environment, while Instagram served as a platform for sharing promotional content and engaging the target audience. Furthermore, the completed short film was published on YouTube to provide broader public access. The combination of these distribution media supported the dissemination and promotion of *"Bipol in Love"* to both the academic community and the wider public.



Figure 4 Poster of "Bipol in Love"

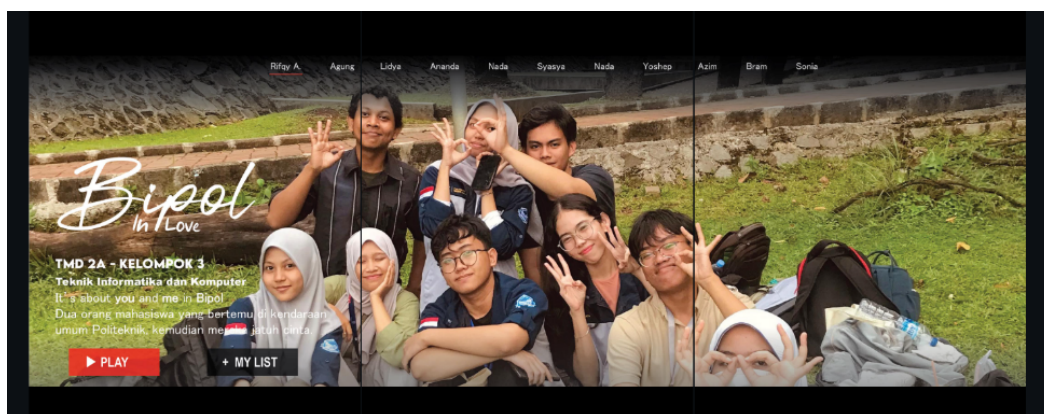


Figure 5 Instagram Promotion of "Bipol in Love"

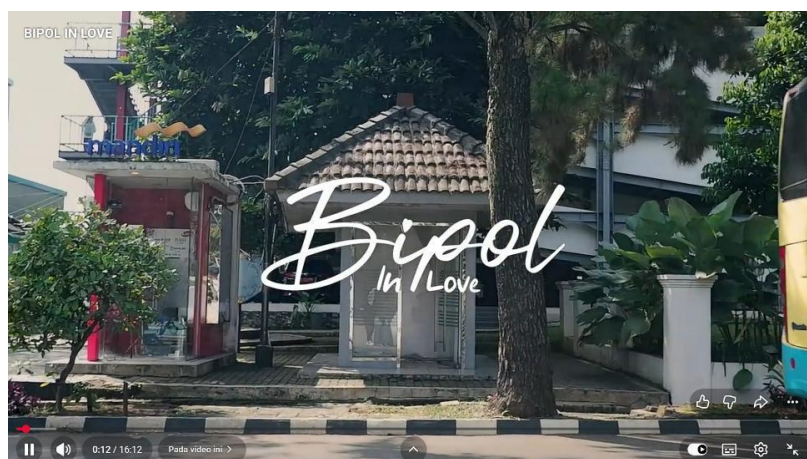


Figure 6 Full Video of "Bipol in Love"

8. Discussion

The implementation of the Multimedia Development Life Cycle (MDLC) in the production of *Bipol in Love* demonstrates that each development stage contributes to a more systematic and organized multimedia production process. The concept and design stages established a clear production direction through the definition of objectives, target audience, storyline, script, and storyboard, which minimized inconsistencies during filming. Furthermore, the material collecting and assembly stages facilitated the integration of multimedia assets into a coherent audiovisual work through structured asset management and editing activities. These findings are consistent with the MDLC concept proposed by Luther and further developed by Sutopo, which emphasizes that multimedia development should follow sequential and well-defined stages to improve production efficiency and product quality. They also support previous studies (Maulana et al., 2025; Pambudi et al., 2025), which reported that MDLC provides an effective framework for managing multimedia development from planning to final production.

The testing and distribution stages further demonstrate the practical contribution of MDLC in ensuring both product quality and audience accessibility. Alpha testing enabled the production team to identify and correct technical issues before publication, thereby improving the overall quality of the final film. Meanwhile, the combination of offline promotion through printed posters and online promotion via Instagram, followed by publication on YouTube, expanded the film's accessibility to the intended audience. Unlike previous studies that mainly focused on documentary films, promotional videos, or specific cinematographic techniques, this study shows that MDLC can also be systematically implemented in the production of a campus-themed narrative short film. Although the findings are limited to the case study of *Bipol in Love*, they provide practical insights into how MDLC can be applied to organize multimedia production activities within higher education environments.

CONCLUSIONS

This study analyzed the implementation of the Multimedia Development Life Cycle (MDLC) in the production process of the short film "*Bipol in Love*." The findings indicate that the implementation of the six MDLC stages (concept, design, material collecting, assembly, testing, and distribution) provided a systematic framework for organizing the filmmaking process from pre-production to distribution. The structured workflow facilitated the planning, production, evaluation, and publication of the short film, demonstrating that MDLC is applicable as a multimedia development method for managing narrative short film production. As a case study, this research provides practical insights into the application of MDLC in multimedia production projects within higher education. Therefore, the findings are expected to serve as a reference for future studies and multimedia practitioners who intend to apply MDLC in similar multimedia development projects.

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