



Design and Implementation of Animated Stickers as an Educational Tool for Adolescent Drug Awareness Using the MDLC Method

Aris Sarwo Nugroho*¹, Mars Caroline Wibowo²

^{1,2}Department Visual Communication Design, Universitas Sains dan Teknologi Komputer, Semarang, Indonesia

Email Address: sarwo@stekom.ac.id (1), caroline@stekom.ac.id (2)

Orcid: <https://orcid.org/0000-0003-1414-1624> (1), <https://orcid.org/0009-0005-2823-3070> (2)

Abstract

This study aims to design and implement animated stickers as an educational medium for drug abuse prevention using the Multimedia Development Life Cycle (MDLC) method. The MDLC process includes six phases: concept, design, material collection, development, testing, and distribution. In the concept phase, the educational goals and target audience are defined. The design phase involves creating visual sketches and animations using Adobe animate. In the material collection phase, relevant information about drug abuse is gathered from trusted sources. During the development phase, the animated stickers are created, incorporating visual and textual elements to convey anti-drug messages. The testing phase evaluates the effectiveness of the stickers using a survey of 100 adolescents aged 13-18 years. The results show a significant increase in understanding of drug abuse, with a 48% improvement in comprehension after exposure to the animated stickers, as measured by a Likert scale survey. The effectiveness was primarily evaluated based on user feedback regarding visual appeal, message clarity, and motivation to avoid drugs. The final phase involves distributing the animated stickers through social media platforms and messaging apps, targeting a broader audience. This study demonstrates that animated stickers are a highly effective tool for increasing drug awareness among young people.

Keywords: Animated Sticker, Drug Abuse Prevention, Digital Education, MDLC

INTRODUCTION

The advancement of digital technology has profoundly impacted various aspects of life, including education, communication, and social campaigns. One of the critical and growing issues is drug abuse, particularly among adolescents. According to the National Narcotics Agency (NNA), in 2022, there were over 3.4 million drug users in Indonesia, with the majority between the ages of 15 and 24, a group highly vulnerable to the adverse effects of drug abuse. This data underscores the urgent need for drug prevention efforts, primarily through innovative methods aligned with the daily lives of young people (Dumchev et al., 2023). Over the past few decades, diverse methods have been employed in drug abuse prevention, ranging from direct educational campaigns and school seminars to distributing brochures and posters (Tremblay et al., 2020). However, these traditional approaches are often less effective in today's digital age. Adolescents, in particular, show little interest in conventional, formal, and static approaches. Being more familiar with technology, social media, and dynamic visual communication, young people necessitate new, interactive, and engaging methods. One promising strategy is the use of visually-driven digital media, such as animated stickers (Nnam et al., 2021).

In this context, animated stickers emerge as a potential educational medium. Animated stickers are digital visuals with simple animations, commonly used in messaging applications like WhatsApp, LINE, and Telegram (Yan et al., 2024). Their purpose is to express emotions or convey messages visually in a more lively and engaging way than static stickers. Additionally, animated stickers offer easy distribution, as they can be shared and accessed effortlessly via social media platforms popular among teenagers. Using this medium in drug prevention campaigns is anticipated to draw greater attention from adolescents, thereby enhancing their awareness of the dangers of drug abuse (Tang et al., 2021).

The gap between conventional educational methods and digital technology-based approaches is considerable. Research by Sellen et al. (2022) reveals that most high school students find drug prevention education delivered through seminars and brochures unappealing and lacking interactivity. Many acknowledge that they respond more positively to content presented through digital and visual media, such as animated videos, educational games, or animated stickers (Sellen et al., 2022). This finding highlights that young people are more inclined toward digital media that aligns with their everyday communication style. Failing to adapt educational methods to adolescents' habits and preferences may render drug prevention efforts less effective (Orsal & Ergun, 2021). Moreover, according to Bucerius et al. (2023), traditional media campaigns often fail to produce long-term behavioral change among teenagers. This shortcoming is attributed to the static and non-continuous nature of conventional media, where conveyed information is brief and fails to establish a lasting impact (Bucerius et al., 2023). Conversely, interactive digital media, such as animated stickers, allow educational messages to be conveyed repeatedly through the devices teenagers regularly use, proving more effective in fostering awareness and deeper understanding of drug risks (Hafez, 2020).

Recent statistics also indicate a rise in drug abuse cases among students in Indonesia. According to a report by the Ministry of Education and Culture (Astuti et al., 2022), approximately 15% of high school students have experimented with drugs at least once. This statistic reinforces the argument that drug prevention campaigns should target adolescents through accessible media. The dissemination of visual and interactive information, like animated stickers on social media and messaging apps, can bring drug awareness closer to teenagers' everyday lives (Ismail et al., 2022). Additionally, the growing trend of digital media use among teenagers supports the application of animated stickers as an educational tool (Bodunde et al., 2022). Fortunato et al. (2023) found that over 95% of teenagers worldwide use smartphones, spending an average of more than five hours daily on social media or messaging applications. This data underscores digital platforms as integral to teenagers' lives, making them an ideal medium for spreading vital social messages, including drug prevention campaigns (Fortunato et al., 2023).

However, limited research has explored animated stickers in drug prevention education. This medium remains relatively new in social campaigns, and literature on its effectiveness in fostering awareness and behavior change remains sparse. This study seeks to fill this gap by exploring animated stickers' potential as an educational tool that not only attracts adolescents' attention but effectively communicates essential information on the dangers of drug abuse (Phithak et al., 2023). Therefore, this study aims to design and implement animated stickers as a relevant and engaging educational tool for conveying drug prevention messages to adolescents. Through the MDLC method, it is expected that the resulting animated stickers will serve as an effective educational medium to increase awareness of drug dangers and help transform adolescents' perceptions and

behaviors regarding drug abuse. This approach offers a novel contribution to developing interactive and appealing digital educational media tailored to the digital communication trends among teenagers.

LITERATURE REVIEW

A. The Use of Animated Stickers in Education

The advancement of digital technology has transformed how information is conveyed, particularly within educational contexts. One innovation that has gained increasing attention in recent years is using animated stickers as an educational medium. Animated stickers are moving images utilized in instant messaging applications and social media to communicate messages visually. As a relatively new medium, animated stickers hold substantial potential in the field of education, especially within interactive learning and the delivery of social messages, such as anti-drug campaigns (Minamide et al., 2021). Research by Minamide et al. (2020) indicates that animated stickers effectively capture adolescents' attention due to their visual and dynamic nature. These stickers can convey messages more expressively and vividly than static stickers or regular images, making information more accessible for the target audience particularly younger generations to retain (Minamide et al., 2020). Another study by Alhumaid et al. (2022) also highlights animated stickers' advantages in social campaigns, where this medium facilitates the delivery of messages interactively and enjoyably, fostering greater audience engagement in educational or campaign processes (Alhumaid et al., 2022).

Using animated stickers in education has become increasingly relevant in an era when social media and messaging applications are integral to young people's daily lives. According to a study by (Qiu et al., 2024), today's adolescents spend an average of over five hours per day on social media, with much of their interaction involving stickers, emojis, and other visual content. Therefore, incorporating animated stickers into educational campaigns, such as drug prevention, can enhance message effectiveness, as this medium is more readily accepted and preferred by the campaign's target audience. Additionally, research by (Chen, 2020) suggests that animated stickers can be a powerful communication tool for delivering messages that may be challenging to address through conventional methods. For instance, in drug prevention education, animated stickers enable the delivery of information about the dangers of drugs in a lighter yet effective manner, without coming across as overly didactic or formal. This approach is crucial for reaching adolescents who are often less receptive to campaigns that feel too formal or monotonous.

B. The Development of the Multimedia Development Life Cycle (MDLC) Method

The MDLC method is a widely used in creating interactive media, including animated sticker development. MDLC provides a structured and systematic methodology for multimedia product development, encompassing several stages from concept to distribution (Ma'rifah et al., 2024). According to (Af'idah et al, 2023), MDLC offers a flexible yet focused framework, making it well-suited for multimedia projects that require visual content, animation, and interactivity processing. The MDLC method has undergone various adjustments and improvements to keep pace with advancements in multimedia technology and user needs. MDLC comprises six phases: concept, design, material collection, production, testing, and distribution. In the concept phase, the project's primary goals are defined, followed by the design phase, where the visual and technical aspects of the multimedia product are outlined. The material collection phase involves gathering relevant content and data, while the production phase focuses on developing animations and visual content.

Testing ensures the quality and functionality of the product, and finally, distribution targets the dissemination of the product to the intended audience (Samala & Amanda, 2023).

A recent study by (Kasmana et al., 2021) the MDLC method has evolved to include a more in-depth evaluation component during the testing phase, particularly regarding effectiveness and user experience. With advancements in technology and increasing user expectations for multimedia products, MDLC now emphasizes feedback from the target audience as a critical element in the development process. This ensures that multimedia products like animated stickers can achieve maximum impact in educational and social campaign contexts. In developing animated stickers for anti-drug campaigns, the MDLC method provides a clear structure across each phase, from planning the educational message to distribution via social media platforms. The method's flexibility allows for adjustments to suit the characteristics of the target audience, teenagers, who are generally more responsive to dynamic visual content.

C. Comparison with Other Methods: ADDIE and Agile Development

Alongside MDLC, other commonly used methods in digital educational media development include ADDIE and Agile Development, each offering distinct advantages and limitations that should be considered in the context of developing animated stickers as an educational tool (Idammatussilmi et al., 2023). The ADDIE method, which stands for Analysis, Design, Development, Implementation, and Evaluation, is one of the most widely used models in educational program development. It emphasizes the importance of needs analysis at the initial stage, during which the problem is to be addressed and the audience's needs are thoroughly defined. In educational media development, ADDIE provides a highly systematic framework in which each phase depends on completing the preceding. For example, the analysis phase forms the foundation for product design and development, ensuring the final product aligns with audience needs (Spatioti et al., 2022).

One major strength of ADDIE is its highly structured approach, allowing for complete control over each development phase. However, a drawback of this method is its rigidity. For dynamic media projects like animated stickers, ADDIE may be overly restrictive, as each phase must be completed sequentially before moving on to the next. This can slow down the development process, especially when changes are needed mid-course (Wan Ali & Wan Yahaya, 2023). On the other hand, Agile Development offers a more flexible and iterative approach to product development. Agile emphasizes continuous improvement through small iterations called "sprints," where each sprint results in a prototype that can be continuously tested and refined. This approach is well-suited for multimedia projects that require real-time adjustments and frequent adaptations (Heimicke et al., 2021).

In developing animated stickers, Agile Development allows development teams to respond more quickly to user feedback, making adapting the product to the audience's preferences and needs easier. However, a challenge of Agile is the increased need for coordination among team members and stakeholders, as frequent changes during development can add complexity to project management (Jonnalagadda et al., 2022). Compared to MDLC, ADDIE is better suited for projects with particular and stable requirements, where thorough analysis can be conducted up front. Agile Development, meanwhile, is ideal for projects requiring high flexibility and adaptability to rapid changes. MDLC, by contrast, strikes a middle ground between the two approaches, offering a structured framework like ADDIE while allowing for iterative adjustments and evaluations similar

to Agile Development (Almelhi, 2021). This study selects MDLC due to its flexibility, facilitating a structured yet adaptable approach for developing animated stickers. Additionally, MDLC emphasizes visualization and interactivity, highly relevant to the animated sticker product developed for an anti-drug campaign. MDLC provides a balance between structured control and flexibility, ensuring the final product can be tailored to the needs of the target audience, who are more responsive to visual and interactive media (Purwanti et al., 2022).

METHODS

This research utilizes the MDLC method, which consists of several phases: concept, design, materials collection, production, testing, and distribution. Each phase is systematically conducted to ensure that the resulting animated stickers effectively convey an anti-drug message to the target audience, teenagers. In the concept phase, the research team first establishes the primary goal of creating animated stickers, aiming to increase teenagers' awareness of the dangers of drugs. An analysis is conducted to understand the target audience's characteristics, teenagers aged 13 to 18. This phase spans two weeks, focusing on planning the educational content in a style that resonates with teenage communication preferences. The narrative developed in this concept phase must convey the message in a light yet meaningful manner so it is comprehensible and well-received by teenagers.

The design phase follows the completion of the concept phase. The design team creates character sketches and storyboards for the animated stickers in this phase. The characters are designed to relate to teenagers, helping them connect with the message. Visual design is developed using Adobe Animate for character animation and Adobe Illustrator for other graphic elements. This design process takes three weeks, involving multiple revisions to ensure every visual element is engaging and aligned with the educational purpose. The character design and storyboard are adjusted based on the audience analysis from the concept phase, allowing the anti-drug message to be conveyed appealingly and interactively. After design, the materials collection phase takes place. In this phase, educational content and information about drug dangers are gathered from trusted sources, including statistical data from the NNA and the Ministry of Health reports. This two-week process ensures that all information incorporated into the animated stickers is accurate and reliable. Additionally, the language used in the educational messages is carefully selected to suit teenage comprehension, making the message more accessible for them to grasp.

The production phase brings the designed characters and animations to life. During this stage, animations are developed using Adobe Animate, with character movements and other visual elements synchronized to the previously planned storyboard. Simple motions, such as facial expressions, hand gestures, and color transitions, are added to create a dynamic and engaging effect. This animation development takes four weeks, with each sticker undergoing several rounds of internal testing to ensure smooth animation and alignment with the intended message. Alongside animation, sound, and text elements are added to reinforce the educational content.

The testing phase assesses the effectiveness of the created animated stickers. This phase involves surveys and interviews with 100 randomly selected teenagers aged 13 to 18 from various schools in and around Jakarta. The survey, conducted online using Google Forms, evaluates aspects such as visual appeal, message comprehension, and the effectiveness of the message in influencing their views on drugs. Respondents rate the animated stickers on a Likert scale from 1 to 5. Additionally, interviews with 20 respondents provide deeper insights into how the stickers influence their

perceptions of drug dangers. The selected respondents have diverse backgrounds, including both male and female students, with the primary criterion being that they are teenagers attending high school.

The final phase is distribution, where the animated stickers are disseminated via popular social media platforms and messaging applications among teenagers, such as WhatsApp, Instagram, LINE, and TikTok. This two-week distribution aims to reach as many teenagers as possible. The stickers are also available for free download on WhatsApp and LINE platforms, allowing teenagers to share them with friends easily. This distribution strategy is expected to extend the reach of the anti-drug message, spreading educational information in a way that is more relatable and relevant to teenagers' daily lives. Figure 1 shows the framework of this study.

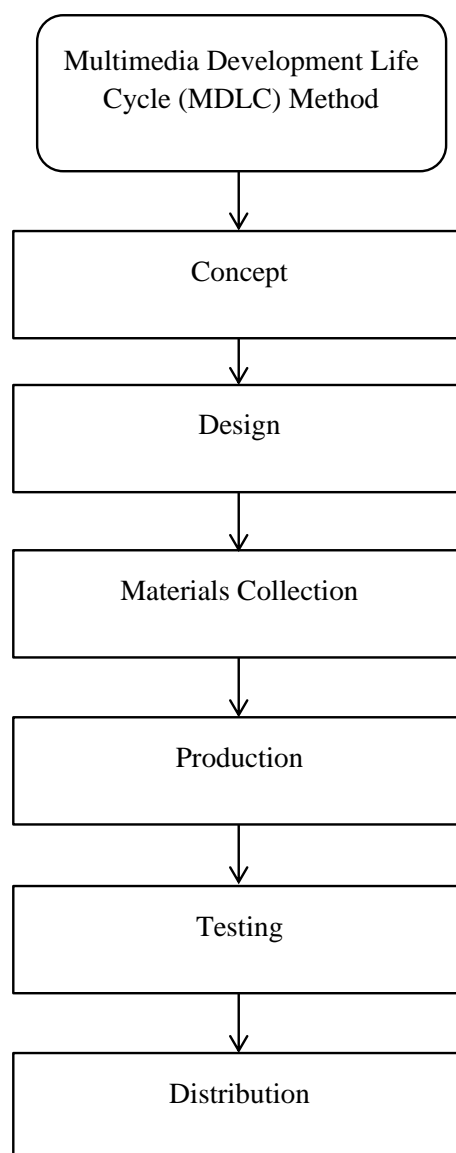


Figure 1. *Research Framework*

RESULTS

A. Result

After developing the animated stickers, trials were conducted with 100 teenagers aged 13 to 18 from various high schools in Jakarta. This testing aimed to evaluate the effectiveness of the animated stickers in improving teenagers' understanding of the dangers of drugs. Data were collected through surveys conducted before and after the respondents viewed the animated stickers. The survey results were then analyzed to assess any changes in their level of understanding. Before viewing the animated stickers, participants were given an initial survey to gauge their baseline understanding of drug risks. The average initial understanding score was 3.1 out of 5, with many respondents indicating that while they had general knowledge about drugs, they were not motivated to explore the subject further or consider the long-term impacts of drug use. After viewing the animated stickers, a second survey was conducted to assess the impact of this educational medium on their understanding. The results showed a significant increase, with the average understanding score rising to 4.6 out of 5. This indicates that the animated stickers captured respondents' attention and enhanced their understanding of the educational messages about drug dangers. The following table 1 the changes in participants' understanding levels before and after viewing the animated stickers.

Table 1. Changes in Participants' Understanding Levels Before and After Using Animated Stickers

Understanding Level	Before Use	After Use
Average (Scale of 1-5)	3,1	4,6

Additionally, the survey assessed other factors rated by respondents, including visual appeal, ease of understanding the message, and whether they felt more motivated to avoid drugs after using the animated stickers. The survey results showed that the animated stickers had a strong visual appeal, with 90% of respondents stating that the characters and animations were engaging and enjoyable to watch. Furthermore, 87% of respondents indicated that the messages conveyed through the animated stickers were easy to understand and relevant to their daily lives. The impact of this medium on teenagers' attitudes toward drugs was also notable, with 80% of respondents acknowledging that after using the animated stickers, they felt more aware of the dangers of drugs and more motivated to stay away from illicit substances:

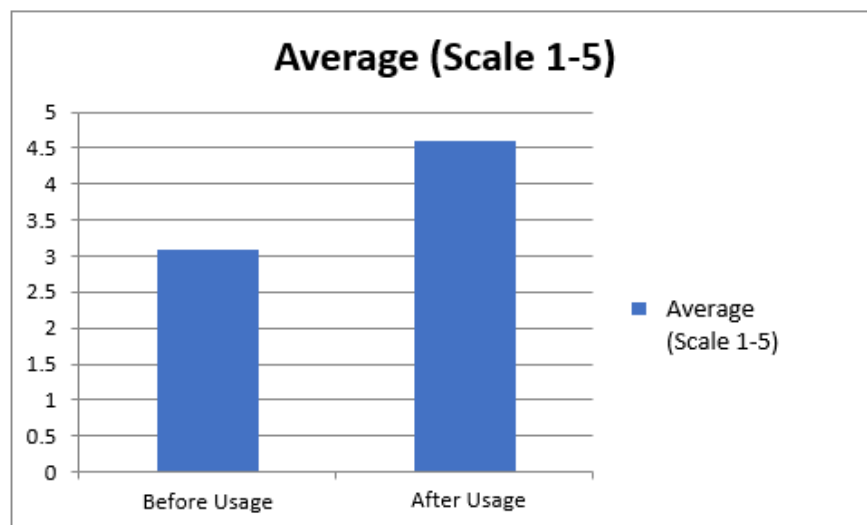


Figure 2. Comparison of Participants' Understanding Levels Before and After Using Animated Stickers

B. Discussion

The findings from this study suggest that animated stickers can serve as an effective educational medium in anti-drug campaigns targeting teenagers. The significant improvement in participants' understanding after using the animated stickers indicates that this interactive visual medium can convey educational content more engagingly than conventional methods. Respondents reported more significant interest in animated messages than traditional brochures or posters, which are generally more static. However, despite these positive results, there are certain limitations to using animated stickers as an educational tool. One primary limitation is the amount of information conveyed in this format. Animated stickers are typically confined to brief, concise messages due to the space and time constraints in animations. This makes them more suitable for conveying simple messages, such as encouraging viewers to avoid drugs, but less ideal for explaining complex information, such as different types of drugs or their long-term effects.

Additionally, while animated stickers have significant potential for dissemination through various digital platforms, there are technical limitations to distribution on some platforms. For example, WhatsApp has file size restrictions for animated stickers, which can limit the complexity and quality of the animations produced. In contrast, platforms like Instagram and TikTok allow for more dynamic visual content. However, user engagement with stickers remains limited since users often view content passively rather than interacting with the stickers. Thus, the effectiveness of animated stickers relies heavily on the distribution platform and how audiences can engage with this medium. From a methodological perspective, applying the MDLC method in developing the animated stickers proved effective in ensuring that each development phase, from concept to distribution, was conducted systematically and with clear direction. However, further testing could explore variations in animation duration and complexity. For instance, future studies could investigate how changes in animation length affect user attention and engagement or how adding interactive features could enhance the effectiveness of animated stickers as an educational tool.

Another limitation is the need for stable internet connectivity for distributing animated stickers. Users in areas with slow internet connections may experience difficulties accessing and downloading the stickers, potentially reducing the campaign's reach. Moreover, producing high-quality animated stickers can be costly, posing a challenge for organizations or individuals interested in similar campaigns but with limited resources. From a distribution standpoint, while animated stickers are easily shareable through messaging apps and social media, a limitation to consider is that this medium may be less effective in reaching audiences beyond teenagers. Older generations or individuals unfamiliar with messaging apps may not respond as positively to this format. Therefore, animated stickers should complement other educational methods better suited to various audience segments. In conclusion, this study demonstrates that animated stickers hold great potential as an educational tool in drug prevention campaigns, particularly for younger audiences who are more responsive to interactive visual content. By addressing the existing limitations, such as enhancing distribution methods and interactivity features, the effectiveness of this medium can be further improved in the future. This research contributes valuable insights into how digital technology can be utilized for social purposes, especially in efforts to prevent drug abuse among teenagers.

CONCLUSION

A. Conclusion

This study has demonstrated that animated stickers serve as an effective educational medium to raise awareness among adolescents about the dangers of drug use. By employing an interactive visual approach, animated stickers capture attention and enhance adolescents' understanding of the negative impacts of drugs. The significant increase in participants' understanding, as observed from the pre- and post-survey results, suggests that this medium can be a practical solution to the challenges of delivering drug prevention messages to young people. The primary contribution of this research lies in the application of digital technology for health education, particularly in drug abuse prevention. Using animated stickers not only makes the message more accessible to adolescents but also provides an appealing and relevant alternative for health campaign strategies. The practical implications of these findings include the potential adoption of animated stickers in other health campaigns, which could reach a broader audience via social media platforms and instant messaging applications. Given their accessibility and ease of distribution, animated stickers have the potential to become valuable tools in preventive campaigns across various fields, such as mental health, sexual health education, and healthy lifestyle promotion.

B. Recommendation

Based on the findings of this study, several recommendations can be proposed for further research. First, the development of more interactive animated stickers could be explored. Adding interactive elements, such as allowing users to choose responses or actions within the animation, may enhance audience engagement and make the educational message more impactful. Additionally, future research could explore the application of animated stickers on broader platforms, such as educational games, where animated stickers could be integrated into gameplay scenarios that illustrate the adverse effects of drugs through simulations or storylines. This research could also be expanded by assessing the effectiveness of animated stickers across different age groups and social backgrounds to determine whether this medium is effective beyond adolescent audiences. Developing more complex animated stickers and using new technologies, such as Augmented Reality (AR), could also be considered to enhance user experience and deliver a more immersive educational message. Further research could also investigate the distribution limitations of stickers on specific platforms and explore solutions to ensure broader access to this medium.

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