



Music video: evaluation of communication media for health campaign in early childhood education and development (ECED) students

Vina Mahdalena ^{a,1,*}, Lusiah Handayani ^{a,2}

^a Universitas Pembangunan Nasional Veteran Jakarta, Jl. RS Fatmawati, Jakarta Selatan 12450, Indonesia

¹ vinamahdalena@upnvj.ac.id; ² lusiahandayani@upnvj.ac.id

* Corresponding Author

ABSTRACT

The media for health campaigns carried out by both the government and the private sector are very diverse. This shows the importance of selecting and packaging media at the planning stage. This research aims to create a music video suitable for the target audience (Early Childhood Education and Development Students) to campaign for the seven steps of hand hygiene. The method is a type of Research and Development (R & D) which focuses on the process of producing the music video. Development models in this research are procedural and considered with suitable objectives to be achieved. The results of the feasibility tested by material experts were 89.9%, media experts were 89.7%, and ECED students were 97.1%. From the percentage of the evaluation test, it can be concluded that the music and video media produced in this study are appropriate to be used as a health campaign tool for ECED students and can be disseminated for the benefit of the community. So, the music video design has been proven to ECED students as a communication media campaign of 7 steps of hand hygiene.



This is an open-access article under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license



Article History

Received 2021-09-23

Revised 2022-05-10

Accepted 2022-06-30

Keywords

Communication media;
ECED students;
Health campaign;
Music video;
Development method

1. Introduction

Communication media planning is the key to the success of a campaign designed by a communication expert. The media for health campaigns carried out by both the government and the private sector are very diverse. This shows the importance of selecting and packaging media at the planning stage. The target audience becomes the focal point of the communication media designer in determining how the media design should be made. Communication media which was originally traditional, has now changed along with the rapid development of technology. Digital media such as video has been effective in reaching program goals. Video is proven to improve understanding of children's oral health [1]–[3], Positively shift farmers' evaluations of the Good Agricultural Practices model [4]–[6], changing children's behaviour by having primary kids wash their hands with soap [7]–[9], the use of audiovisual media is useful for preventing gastritis by boosting knowledge, attitudes, and behaviour in health promotion efforts [10]. Media creation such as video can be utilized for a variety of objectives; in certain studies, it is employed as a teaching tool to help students solve social arithmetic problems mentally [11], [12]. The results of other research related to media development and the impact of technological advancements on the use of music and video-making applications have enabled adolescents and young adults to be creative in arranging and processing videos with various effects according to their abilities and preferences so that music and videos can be used as vital promotional tools in various media [13]. Additionally, media design can be utilized to boost student motivation and diligence [14]. Diverse software exists for creating video media, beginning with Video Scribe Sparkol, which is utilized in history courses [15], Powtoon application for animation, which is used in civic education subjects [16], and Camtasia Studio developed interactive learning media

in the form of videos to describe the efficacy of employing learning videos for Earthquake Engineering courses at Andalas University's Civil Engineering Department as a learning approach in the Covid 19 era [17]. From previous research, we are interested in designing communication media to be used as a health campaign tool among Early Childhood Education and Development (ECED) students. So, we as researchers will create fun communication media for children so that they can easily understand how to wash their hands properly and correctly using soap. When going to socialization at school, of course, you cannot just use the lecture method or just stick to a poster at school, but it must be done in fun ways such as being given a show or song so it is easy to memorize and remember so that the next effect can change a person's behaviour, especially children. Biologically, a song with a pleasant rhythm can stimulate the nerves in the brain so that it can work better in processing messages and psychologically, the song provides a pleasant and soothing emotional effect so that the brain can store it in Long Term Memory (LTM). The importance of accuracy in choosing communication media will have an impact on the effectiveness of the messages that have been designed. So, researchers will try to design songs to be used as a communication medium in order to make health campaigns succeed in schools. Researchers will focus on the health campaign in schools, namely washing hands with running water and using soap. The movement of washing hands is a basic thing, and it seems so easy, but it is very difficult to do if we do not understand the right way. So, the researcher was interested in making a 7-step hand-washing music video design and researching how effective the song was in socializing hand-washing movements to ECED students.

Media planning is closely related to the selection of the right communication media to socialize a program. Accuracy in using communication media will have an impact on the achievement of the objectives of a program. Therefore it is important for communicators to recognize the communicant in communicating. Knowing clearly how the characteristics of the communicant can provide several alternative choices of communication media, then this is what is called media planning. Media planning is a series of decisions that involve elements of the selection of promotional media for the communicants (program users). Media planning serves as a guide for media selection. Before planning a media, it is necessary to have specific media objectives and media strategies. The purpose of the media is the basis of information that will be used for selecting the right media. Furthermore, it is explained that media planning and strategy focuses on efforts to determine the best way to convey a message which consists of four steps, namely; (1) Determination of target communicants; (2) Determining the purpose of the media; (3) Planning and implementing a media strategy; (4) Evaluation and follow-up. Determination of target communicants is answered with several important questions such as who is the target audience or target audience? Where is the target audience located? How big is the target audience? How many levels of exposure are the target audience? How is the situation in the area or facilities and infrastructure that support the target audience exposed to the communication message? Media objectives describe what the government wants to achieve with regard to delivering messages to a program. Media factors include the following; (1) Audience attention; (2) Scheduling; (3) Number of media; (4) Media support. Furthermore, a situation analysis is needed, which forms the basis for media planning and strategy. Finally, there needs to be an evaluation of the media that has been designed and how to follow up in the future so that the utilization of the media used is optimal.

Rahmaturrizki et al. proposed that audio media in learning delivers messages in the form of an auditive (tape or sound plate) that can excite students' thoughts, emotions, attention, and willingness to facilitate the teaching and learning process [18]. According to Mayer, the material in audio consists of narration, music illustrations, and sound effects; (1) Narration is a text that is organized according to standard rules and is read by a narrator; (2) Music illustrations are musical examples that accompany the narration. A music illustration is a collection of tones that sound rhythmical to set the mood or atmosphere in general. The usage of music must correspond with the exhibited visuals so that the meaning is not misunderstood, and (3) Sound effects are audible sounds that accompany the narration. A good narrative resembles a speech in that it is continuous and regular in its delivery, with the exception that the narrative has been prerecorded. The usage of tone and tone of voice must be acceptable while delivering a tale;

otherwise, it will seem unnatural. Sound effects are used to change audio elements to create a certain ambience [19]. With the correct sound effects, a presentation becomes effective because the audience can feel the ambience that is one with the visuals exhibited; this creates a more realistic experiential effect, making the material simpler to retain. Researchers will use audio in the form of songs to communicate hand washing movements to pupils in schools through PHBS. Table 1 contains the song lyrics for washing hands with soap.

Table 1. The song lyrics about washing hands using soap

Song lyrics	Translation
<i>Sebelum dan sesudah melakukan tindakan</i>	Before and after taking action
<i>Ada 7 cara mencuci tangan</i>	There are 7 ways to wash your hands
<i>Mari, mari membersihkan tangan</i>	Come on, let's clean our hands
<i>Pertama, membersihkan telapak</i>	First, clean the palms
<i>Kedua, membersihkan punggung tangan</i>	Second, clean the back of the hand
<i>Ketiga, telapak dengan telapak</i>	Third, palm with palm
<i>Jari-jari saling terkait</i>	Intertwined fingers
<i>Keempat, membersihkan siku jari dengan tangan saling terkunci</i>	Fourth, clean the elbows of the fingers with interlocked hands. Fifth, clean the thumb by rubbing and twisting. Sixth, cleaning the fingertips
<i>Kelima, membersihkan ibu jari digosok-gosok dan putar-putar</i>	Seventh, clean the wrist
<i>Keenam, membersihkan ujung jari</i>	
<i>Ketujuh, membersihkan pergelangan</i>	That is how to wash your hands, to maintain health
<i>Itulah cara mencuci tangan, tuk menjaga kesehatan</i>	

Visual elements must be able to attract attention while conveying ideas, messages, and images to be displayed. A number of visual elements must be coordinated and organized, including action sequences, demonstrations, locations, lighting, graphics, colours, and models [20]. According to Ferguson et al., visualization allows one to perceive the unseen through the use of numerous elements, including: (1) the use of signs; (2) drawing; (3) symbols and signs; (4) knowledge of letter writing (typography); and (5) illustrations and colours [21]. It is known that visualization can make it easier for audiences to accept and understand the content of messages, but not all types of visualization are equally effective in increasing knowledge, let alone assessing the audience. Visualization can convince the communicant in persuasion communication. Many experts think that visual images often take precedence over their verbal counterparts in the persuasion process because they easily attract people's attention and effectively influence their emotions. So, communicators use visual elements as a means of persuading their communicants.

Researchers will use visual communication media in the form of motion pictures. Visual communication media will be designed so that students can better understand the importance of health campaigns, especially hand washing movements and how to take proper and correct hand washing. In the guidebook for evaluating educational media from the Directorate General of Primary and Secondary Education, it is stated that the specific criteria for evaluating audio and visual communication media include several aspects, including; (1) In terms of material; In accordance with the objectives formulated, easy to understand, in accordance with the level of student ability, materials are presented from easy to difficult, not much use of difficult words; (2) In terms of narrative, sound volume is good enough, voice intonation is good enough, language style, clarity of speech, the tempo of speech; (3) In terms of visualization, image size, image composition, color image, image sharpness, image lighting, illustrations support images, letters are easy to draw, caption/attractive graphics, in terms of music/sound effects, music illustrations support the program, sound effects support the program, illustration music/sound effects are not too loud; (4) In terms of presentation, systematic, change of pictures is not too fast. According to the World Health Organization (WHO), the material and socialization activities are teaching seven steps to wash hands, including [22]; (1) Rub soap onto the palms evenly; (2) Right palm over left dorsum with interlaced fingers and vice versa; (3) Palm to palm with fingers interlaced; (4) Backs of fingers to opposing palms with fingers interlocked; (5) Rotational rubbing of left thumb clasped in right palm and vice versa; (6) Rotational rubbing, backwards and forwards with clasped fingers of the right hand in left palm and vice versa; (7) Clean both wrists alternately. More details can be seen in Figure 1.



Fig. 1. Rub Hands for Hand Hygiene

2. Method

This research is a sort of Research and Development (R & D) that focuses on the process; research does not generate tangible items, whereas development produces tangible objects. Development is an engineering process involving the arrangement of a sequence of pieces into a result. Research and Development Methods are research techniques used to generate specific items and evaluate their efficacy [23]. There are procedural models, conceptual models, and theoretical models for development. In this development research, a procedural model is used because it is deemed suitable for the development objectives to be attained, namely the production of a product and the testing of the product's viability. To achieve these objectives, it is necessary to follow a series of steps that must be followed to produce specific products. A procedural model is a descriptive model that illustrates the steps required to make a product. Using a development model, this development research will produce a health campaign video media product titled "Seven Steps Hand Hygiene" [24].

- Planning; Determining needs and goals, needs and objectives include what students will know or can do after completing learning; Collecting sources, the intended sources such as textbooks, reference books, original source materials, films and knowledge from other people in the field that support material and media; Generating ideas, this stage is brainstorming to produce creative ideas in development.
- Design (goal); Making a written storyboard, this stage includes planning (drafting), writing and revising the storyboard along with its appearance, animation, graphics, and music, then validating it; Preparing the script, this stage includes planning the narrative, instruments, animation and music on the video.
- Development; Producing video and audio; in this stage, creating displays, animations, graphics, music, narration, and instruments that can support development; Preparing the supporting components; Evaluating and reviewing (testing and validation).

Children are the research subjects that will be employed as respondents for the feasibility test of the study. This is why we chose music videos as the medium for the "7 Steps to Hand Hygiene" health campaign. Children are particularly receptive to being stimulated by upbeat melodies. Therefore, it is essential that the team package this media as attractively as possible

so that viewers are inclined to follow the video's directions. Figure 2 depicts the required steps for doing research.



Fig. 2. Research and Development Procedure

3. Results and Discussion

Media trial and evaluation activities were carried out before the video was used in the experimental treatment. This is done to determine whether the video is appropriate to be given to respondents. The feasibility of the media is said to be feasible if the percentage is > 50%; if the percentage is <50%, then a revision must be made because the media is not yet suitable to be presented to respondents. This evaluation activity involves experts, namely media and material experts. Furthermore, the trial activity requires 23 non-responders who have the same characteristics as the respondent. Evaluation of video media based on five indicators which can be seen in Table 2. This research requires material experts to evaluate whether the material presented is appropriate and correct in accordance with the needs of the objectives of the health campaign, especially hand hygiene activities. So, we chose three material experts in the health sector, namely; (1) dr. Sofia Wardhani, MKK (Lecturer in Nutrition Sciences at UPN Veteran Jakarta); (2) Dyah Utari (Lecturer of Public Health at UPN Veteran Jakarta); (3) Agustina (Lecturer of Public Health at UPN Veteran Jakarta). This evaluation is given using a questionnaire in the form of closed and open questions. Several points of concern and expert advice have made this media's design even better. Based on the data in Table 3, in terms of material, 100% of experts agree that the material is correct and appropriate to be used as material for socialization among ECED students. For the narrative, 76.7% of experts gave responses to improving the voice of the singer, which sometimes appears immersed in music. So the researchers did the editing again to increase the singer's voice rather than the sound of the music. Pronunciation (articulation) is also one of the obstacles in itself because the singer is a toddler; therefore, the process of taking vocals is finally carried out per word to make it clearer in the pronunciation of the song lyrics. Apart from that, the researcher also added song lyrics to the video to clarify what the singer was actually saying.

In the visualization section, 81.3% of experts gave responses so that the researcher could clarify the video more, and the revision made was to make a video washing hands using the zoom-in technique (focus on one thing). In the video, 7 Steps of Hands Hygiene, the researcher selects an image that focuses on the video model of the hand so that it is clearer how to wash hands properly. Audio is very appropriate to be presented to ECED students for the socialization of 7 Steps to Wash Hands because 100% of experts have responded that the suitability of music created by researchers with the material is compatible with the characteristics of ECED students. Finally, the presentation got 91.7%; the expert argued that the music video presentation was appropriate for use as a media for health campaigns, especially hand hygiene for children. This research requires not only material experts but also media experts to evaluate whether the media plan that has been made is feasible so that it can be used for health campaigns, especially hand hygiene activities. So, we selected three media experts in the field of communication, namely; (1) Ahmad Zakki Abdullah (Lecturer in Communication Sciences at UPN Veteran Jakarta, Digital Media); (2) Azwar (Lecturer in Communication Studies at UPN Veteran Jakarta); (3) Sekar (Author, Content Creator). Furthermore, we will also invite media experts to participate in improving the design of the music video "7 Steps Hands Hygiene".

Table 2. Dimension and Indicator of Music Video Evaluation

Dimension	Indicator
Material	In accordance with the objectives formulated.
	Easy to understand.
	In accordance with the level of student ability.
	Materials are presented from easy to difficult.
Narrative	Not much use of difficult words.
	The sound volume is good enough.
	Voice intonation is good enough.
	Language style.
	Clarity of speech.
Visualization	The tempo of speech.
	Image size.
	Image composition.
	Colour image.
	Image sharpness.
	Image lighting.
	Illustrations support images.
Audio	Letters are easy to draw.
	Caption / attractive graphics.
	Music illustrations support the program.
Presentation	Sound effects support the program.
	Illustration music/sound effects are not too loud.
	Systematic.
	Change of pictures is not too fast.

This evaluation is given using a questionnaire in the form of closed and open questions. In terms of material, 100% of experts agree that the material is correct and appropriate to be used as material for socialization among PAUD students. For the narrative, 90% of experts responded that singers who are toddlers have a level of confidence and cheerfulness that deserves thumbs up, even though there are still improvements in the tone of the singer's voice. So the researcher re-edited to lower the basic tone of the music so that it could match the tone/voice of the singer. You should also remove the reverb/echo effect on the sound as it makes the lyrics difficult to grasp. In the visualization section, 66.7% of experts responded that some of the shots taken looked less neat and unstable; this was a constraint for researchers because the tools used for shooting music videos were only cellphones, for that revision that might be used was taking shots which later could be prepared more matured again and used a more viable tool for shooting music videos. The revised typography in writing the lyrics on the video was also improved to make it easier to read. Audio received 91.7%, and the experts agreed that the music presented was appropriate to be broadcast as a socialization material for 7 Steps Hands Hygiene.

Table 3. Results of The Material Experts Evaluation

Socialization Material	Percentage
Material	100.0%
Narrative	76.7%
Visualization	81.3%
Audio	100.0%
Presentation	91.7%
Percentage Eligibility	89.9%

Finally, the presentation got 100%; the expert argued that the music video presentation was appropriate for use as a medium for health campaigns, especially washing hands for children, see [Table 4](#). After being evaluated by the experts, the researcher distributed it to non-respondents to do a trial with the same audience as the research respondents, namely ECED students. The trial involved 23 ECED students, and the researcher gave the 7 Steps Hands Hygiene music video, then the students watched it and, after that, filled out a questionnaire guided by their parents. This trial was conducted online because it was a pandemic, and children were not allowed to go to school.

Table 4. Results of The Media Experts Evaluation

Socialization Material	Percentage
Material	100.0%
Narrative	90.0%
Visualization	66.7%
Audio	91.7%
Presentation	100.0%
Percentage Eligibility	89.7%

Table 5 shows that the test results of all evaluation dimensions are above 50%, so the total percentage of eligibility for media trials is 97.1%. The media trial was declared feasible to be broadcast and disseminated for research and socialization needs of the 7 Steps Hands Hygiene. Most of the audiences who watched this music video agreed and considered that the video was appropriate to be broadcast to their fellow PAUD friends. Because they not only like music that is packaged with joy that is typical of children, but they are also interested in the music video model who is also their age friend. The model shown has introduced themselves first to community service activities at school so that they feel there is more closeness and interest in watching and following what is being socialized. From the process of evaluation and media trials conducted, the researcher plans to register the results of the music videos that are eligible for intellectual property rights as an additional output of this research.

Table 5. The Results of the Trials by ECED Students

Socialization Material	Percentage
Material	97.8%
Narrative	94.3%
Visualization	98.1%
Audio	95.1%
Presentation	100.0%
Percentage Eligibility	97.1%

This development research will produce a health campaign video media product, "7 Steps Hands Hygiene", using a development model, including [24].

3.1. Planning

1) Determining needs and goals, needs and objectives.

Initial observations were made at school by observing how children wash their hands in the school sink. 100% (23 students) had taken the first step correctly, namely rubbing the palms of their hands with soap. In the second to sixth steps, none of the students knew this step because there had never been any socialization at school about hand hygiene. In the seventh step, there are four students who already understand how to clean both wrists in turn. The results of these preliminary observations are the main reason the research team emphasizes the material in section 7 steps of hands hygiene and really thinks about how to design an effective media so that children can change their inappropriate handwashing habits for the better and can be applied in everyday life.

2) Collecting sources.

The materials we use refer to the WHO guidebook, which explains how to wash hands properly. We also received some input from material experts in the health sector to complement the existing material. Furthermore, we are looking for references to children's music videos to have a complete picture of what attracts children's attention in watching videos so that the knowledge provided can be well received.

3) Generating ideas.

The final stage in the planning section is brainstorming with the team about what can be done to solve the existing problems. The solution that we can do is to create a health campaign media that is attractive to children and test the feasibility of the media so that it can be developed as an effective tool as a health campaign media. Digital media in the form of music videos is very flexible and easily accessible from gadgets owned by parents of students,

especially during this pandemic, they are currently learning online via WhatsApp Group (WAG). So, the research team decided to test the feasibility of this music video via WAG that students use for online learning. It is also possible for students to repeat the music videos and get more exposure so that they can be studied over and over again.

3.2. Design (goal)




1) Creating music.






The first thing to do is look for suitable material and then arrange it into a continuous lyric so that a simple sentence is produced. This is necessary because the target of the health campaign program is children. Furthermore, the team made song arrangements with keyboard musical instruments, looking for the appropriate tempo; the final tone was combined with the existing lyrics.

2) Arranging storyboards.

Table 6 has presented storyboards that are used as production guidelines. Starting from the introduction showing a model girl who was dancing cheerfully, then she began to invite the audience to do the seven steps of hands hygiene; (1) Rub soap onto the palms evenly; (2) Right palm over left dorsum with interlaced fingers and vice versa; (3) Palm to palm with fingers interlaced; (4) Backs of fingers to opposing palms with fingers interlocked; (5) Rotational rubbing of left thumb clasped in right palm and vice versa; (6) Rotational rubbing, backwards and forwards with clasped fingers of the right hand in left palm and vice versa; (7) Clean both wrists alternately. The end of the video mentioned the benefits of washing hands to maintain health. The duration displayed for each step is approximately 10-11 seconds so that children can pay more attention to it, making it easier for them to imitate and practice it. We use the zoom shot method so that children's attention is more focused on one thing. Making storyboards is designed as simple as possible with the aim of no other visual that distracts children's attention other than the steps of hand hygiene.

Table 6. Storyboards

Scene & Board	Duration	Lyrics
	10 sec	(Introducing the musicvideo model, a girl is dancing cheerfully)
	21 sec	Before and after, take action. There are seven ways to wash your hands, Come on, let's clean our hands.
	11 sec	First, clean the palms. Second, clean the back of the hand.

Scene & Board	Duration	Lyrics
 <p>Ketiga, Telapak dengan Telapak Jari-jari Saling Terkai</p>	10 sec	Third, palm with palm. The fingers are intertwined.
 <p>Keempat, Membersihkan Siku Jari Dengan Tangan Saling Mengunci</p>	11 sec	Fourth, clean the elbows. With interlocked hands.
 <p>Kelima, Membersihkan Ibu Jari Digosok-Gosok dan Putar-Putar</p>	11 sec	Fifth, clean the thumb. Rubbing and twisting.
 <p>Kelima, Membersihkan Ujung Jari Ketujuh, Membersihkan Pergelangan</p>	10 sec	Sixth, clean the fingertips. Ketujuh, clean the wrist.
 <p>Inilah Cara Mencuci Tangan, Tuk Menjaga Kesehatan...</p>	12 sec	That is how to wash your hands. To maintain health.

3.3. Development

1) Producing music and shooting.

In this section, the team carried out many activities with several tools for recording voice, namely Nana as a model and singer who was shown in the music video. Sound production in a home studio using Adobe Soundbooth software. The sound of the instrument and the voice of the singer are recorded separately and then combined using Adobe Audition software for good sound quality. The team experienced several problems when recording the children's voices because the original sound's tone, tempo and pitch did not match the rhythm of the music, so various adjustments were needed to make the sounds good. The solution to the problem is that the team cuts every word the child mentions into unity with the music so that it matches the resulting tone, tempo and pitch. During the shooting process, we were also constrained by the difficulty of the children's models, which were difficult to fully manage because they preferred to do fun things that they used to do. So, the team used a few tips, installing the camera secretly while playing the song seven steps hands hygiene so that the shooting results obtained naturally look interesting and fun. During the hand washing process, the children's models had been trained for about two months on how they should scrub and do the seven steps of hand hygiene.

2) *Editing music video.*

Editing is very necessary for the process of working on music videos, and the team used Adobe Premiere Pro to do it. The first step is to enter the music that is ready with a good song arrangement. Then the image selection is carried out from the shooting process that has been done previously. This process requires accuracy and compatibility between the music and the image displayed. Some scenes are given simple transition effects to make them look smoother.

3) *Evaluating and reviewing.*

In research and development methods, the important thing to do is to evaluate whether the products produced are suitable for dissemination to the needs of the community. The team carried out three steps of evaluation in the form of a media feasibility test, first, a feasibility test for a material expert, second due diligence on a media expert, and third due diligence on the target audience, namely ECED students. The team will review the evaluation results to make improvements so that the resulting music video production is better than before.

4. Conclusion

Health campaign media development has passed several steps, including; (1) Planning (determining needs and goals, collecting sources, generating ideas); (2) Design (creating music, arranging storyboards); (3) Development (producing music and shooting, editing a music video, evaluating and reviewing). The feasibility test results tested by material experts were 89.9%, media experts were 89.7%, and ECED students were 97.1%. From the percentage of the evaluation test, it can be concluded that the music and video media produced in this study are appropriate to be used as a health campaign tool for ECED students and can be disseminated for the benefit of the community.

References

- [1] F. Loy, B. Underwood, and C. Stevens, "Watch and learn? A systematic review comparing oral health educational videos with written patient information aimed at parents/carers or children," *Br. Dent. J.*, pp. 1–6, Nov. 2021, doi: [10.1038/s41415-021-3616-5](https://doi.org/10.1038/s41415-021-3616-5).
- [2] B. Olubunmi and I. Olushola, "Effects of Information Dissemination Using Video Of Indigenous Language On 11-12 Years Children's Dental Health," *Ethiop. J. Health Sci.*, vol. 23, no. 3, pp. 201–208, Nov. 2013, doi: [10.4314/ejhs.v23i3.2](https://doi.org/10.4314/ejhs.v23i3.2).
- [3] C. M. Lalchandani, S. Tandon, T. S. Rai, and A. Kajal, "Efficacy of an audio-visual aid in improving knowledge and awareness towards infant oral health care for expectant mothers.," *JIDA J. Indian Dent. Assoc.*, vol. 14, no. 2, pp. 13–20, 2020. doi: [10.33882/jida.13.25520](https://doi.org/10.33882/jida.13.25520)
- [4] I. Jelsma, L. S. Woittiez, J. Ollivier, and A. H. Dharmawan, "Do wealthy farmers implement better agricultural practices? An assessment of implementation of Good Agricultural Practices among different types of independent oil palm smallholders in Riau, Indonesia," *Agric. Syst.*, vol. 170, pp. 63–76, Mar. 2019, doi: [10.1016/j.agsy.2018.11.004](https://doi.org/10.1016/j.agsy.2018.11.004).
- [5] L.-A. Sutherland and I. Darnhofer, "Of organic farmers and 'good farmers': Changing habitus in rural England," *J. Rural Stud.*, vol. 28, no. 3, pp. 232–240, Jul. 2012, doi: [10.1016/j.jrurstud.2012.03.003](https://doi.org/10.1016/j.jrurstud.2012.03.003).
- [6] A. H. Awang *et al.*, "Peat Land Oil Palm Farmers' Direct and Indirect Benefits from Good Agriculture Practices," *Sustainability*, vol. 13, no. 14, p. 7843, Jul. 2021, doi: [10.3390/su13147843](https://doi.org/10.3390/su13147843).
- [7] J. Watson, O. Cumming, A. MacDougall, A. Czerniewska, and R. Dreibelbis, "Effectiveness of behaviour change techniques used in hand hygiene interventions targeting older children – A systematic review," *Soc. Sci. Med.*, vol. 281, p. 114090, Jul. 2021, doi: [10.1016/j.socscimed.2021.114090](https://doi.org/10.1016/j.socscimed.2021.114090).
- [8] S. White, A. H. Thorseth, R. Dreibelbis, and V. Curtis, "The determinants of handwashing behaviour in domestic settings: An integrative systematic review," *Int. J. Hyg. Environ. Health*, vol. 227, p. 113512, Jun. 2020, doi: [10.1016/j.ijheh.2020.113512](https://doi.org/10.1016/j.ijheh.2020.113512).

- [9] J. Watson et al., "Child's play: Harnessing play and curiosity motives to improve child handwashing in a humanitarian setting," *Int. J. Hyg. Environ. Health*, vol. 222, no. 2, pp. 177–182, Mar. 2019, doi: [10.1016/j.ijheh.2018.09.002](https://doi.org/10.1016/j.ijheh.2018.09.002).
- [10] Y.-Siregar, K. Rochadi, and N. Lubis, "The effect of health promotion using leaflets and audio-visual on improving knowledge and attitude toward the danger of HIV/AIDS among adolescents," *Int. J. Nurs. Heal. Serv.*, vol. 2, no. 3, pp. 172–179, Sep. 2019, doi: [10.35654/ijnhs.v2i3.213](https://doi.org/10.35654/ijnhs.v2i3.213).
- [11] J. Threlfall, "Strategies and flexibility in mental calculation," *ZDM*, vol. 41, no. 5, pp. 541–555, Oct. 2009, doi: [10.1007/s11858-009-0195-3](https://doi.org/10.1007/s11858-009-0195-3).
- [12] R. Gürbüz and E. Erdem, "Relationship between mental computation and mathematical reasoning," *Cogent Educ.*, vol. 3, no. 1, p. 1212683, Dec. 2016, doi: [10.1080/2331186X.2016.1212683](https://doi.org/10.1080/2331186X.2016.1212683).
- [13] A. J. Macnab and R. Mukisa, "Celebrity endorsed music videos: innovation to foster youth health promotion," *Health Promot. Int.*, vol. 34, no. 4, pp. 716–725, 2019, doi: [10.1093/heapro/day042](https://doi.org/10.1093/heapro/day042).
- [14] Y.-S. Chang, "Applying the ARCS Motivation Theory for the Assessment of AR Digital Media Design Learning Effectiveness," *Sustainability*, vol. 13, no. 21, p. 12296, Nov. 2021, doi: [10.3390/su132112296](https://doi.org/10.3390/su132112296).
- [15] A. Rasyid, M. Mustari, Y. N. Aziziy, and D. S. Nahdi, "Guided inquiry with sparkol videoscribe in science learning: a study of students' scientific attitudes," *Int. J. Educ. Innov. Res.*, vol. 1, no. 1, pp. 34–41, Jan. 2022, doi: [10.31949/ijeir.v1i1.1899](https://doi.org/10.31949/ijeir.v1i1.1899).
- [16] E. Nurdiansyah, E. El Faisal, and S. Sulkipani, "Utilization Of Powtoon To Improve Student Learning Outcomes at Citizenship Education Course," in *Sriwijaya University Learning and Education International Conference*, 2018, vol. 3, no. 1, pp. 627–630. Available at: [Google Scholar](https://scholar.google.com/).
- [17] J. Sunaryati and R. Kurniawan, "The Use of Instructional Videos as a Learning Medium for Understanding the Subject of Earthquake Engineering," in *Proceedings of the 3rd International Conference on Educational Development and Quality Assurance (ICED-QA 2020)*, 2021, pp. 502–505, doi: [10.2991/assehr.k.210202.087](https://doi.org/10.2991/assehr.k.210202.087).
- [18] M. I. Rahmaturrizki and Y. Sukmayadi, "YouTube as Audio Visual Media Learning in Music Education," in *Proceedings of the 3rd International Conference on Arts and Design Education (ICADE 2020)*, 2021, pp. 297–303, doi: [10.2991/assehr.k.210203.064](https://doi.org/10.2991/assehr.k.210203.064).
- [19] R. E. Mayer, "Elements of a Science of E-Learning," *J. Educ. Comput. Res.*, vol. 29, no. 3, pp. 297–313, Oct. 2003, doi: [10.2190/YJLG-09F9-XKAX-753D](https://doi.org/10.2190/YJLG-09F9-XKAX-753D).
- [20] P. Ardianto and W. Manuel Son, "Visual Semiotics Analysis on Television Ads UHT Ultra Milk 'Love Life, Love Milk,'" *Int. J. Vis. Perform. Arts*, vol. 1, no. 1, pp. 27–41, Jun. 2019, doi: [10.31763/viperarts.v1i1.13](https://doi.org/10.31763/viperarts.v1i1.13).
- [21] D. A. Ferguson and C. F. Greer, "Visualizing a Non-Visual Medium through Social Media: The Semiotics of Radio Station Posts on Instagram," *J. Radio Audio Media*, vol. 25, no. 1, pp. 126–141, Jan. 2018, doi: [10.1080/19376529.2017.1385617](https://doi.org/10.1080/19376529.2017.1385617).
- [22] W. H. Organization, *Water and sanitation for health facility improvement tool (WASH FIT): manual for trainer*. Geneva: World Health Organization, 2022. Available at: apps.who.int
- [23] J. Sandars, D. Cecilio-Fernandes, R. Patel, and R. Gandomkar, "Avoid 'running before we can walk' in medical education research: The importance of design and development research," *Med. Teach.*, vol. 43, no. 11, pp. 1335–1336, Nov. 2021, doi: [10.1080/0142159X.2020.1854452](https://doi.org/10.1080/0142159X.2020.1854452).
- [24] S. M. Alessi and S. R. Trollip, *Multimedia for learning: Methods and development*. Allyn & Bacon, 2001. Available at: [Google Scholar](https://scholar.google.com/).