AUDIO-VISUAL LEARNING THROUGH ANIMATED VIDEO APPROACH FOR CHILDREN WITH INTELLECTUAL DISABILITIES

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ABSTRACT

Fundamentally, children with intellectual disabilities face learning difficulties, particularly in academic memory, and thus require education that emphasizes training, guidance, and support to optimize their potential. Visual learning is related to visual attention, memory, and the ability to distinguish conceptual and perceptual differences (shape stability, form/model, and base) and its cognitive aspects. The learning method we use involves several stages. First, we present two animated educational videos about letters and numbers, as well as animated videos introducing numbers, along with various interactive approaches for the participants with intellectual disabilities. The selection of participants is also based on the criteria and categories set by the institution. The results of this animated video learning are not only engaging and enjoyable but also foster good interaction between participants, educators, parents, and their environment. With visuals that are focused and well-organized, the learning attention can be directed effectively. The characters featured in the animated videos provide a more enjoyable experience, interact with the actions of the characters, and become iconic, making them easy for the participants to follow and remember.

Keywords: intellectual disability, animation, interactive, audio-visual, education

INTRODUCTION

Intellectual and mental weaknesses, referred to as intellectual disability, cannot be cured, but this does not mean rejecting general educational information provided. This weakness is described as noise in message reception, requiring a high level of redundancy to overcome disruptions in message delivery. Special education focused on individuals with mental disabilities has led to the emergence of specialized education for various learning disabilities (Alenizi, 2019). Children with intellectual disabilities are described as individuals with below-average IQs. The classification of individuals with intellectual disabilities is divided into three categories: mild intellectual disability with an average IQ of 50-70, moderate intellectual disability with an average IQ of 25-50, and severe intellectual disability with an IQ below 25 (Association, 2000).

Visual learning for children with intellectual disabilities is indeed an important aspect. Attention to visual stimuli, memory, and the differentiation of concepts between visual subjects, whether in shape, model, or base, serves as a placement for their cognition (Mona et al., 2015). In fact, research on visual learning has been conducted by several researchers, such as audio-visual learning to observe the characteristics and gross motor skills of students with intellectual disabilities (Louk & Sukoco, 2016), visual learning through fine arts to gain visual perception as part of skills, eye contact coordination between hands and eyes, building a personality of sharing, and motor skill acquisition (Erim & Caferoğlu, 2017), as well as research on learning the alphabet using three dimensions (Laila & Damri, 2023).

At the Amal Mulia Foundation in South Jakarta, a significant number of students with intellectual disabilities are enrolled, with learning methods similar to those in regular education, such as spelling, reading, and writing. Additionally, visual learning plays an important role because the mental challenges in memorizing written forms can be quite difficult, making visuals or images an engaging aspect of the teaching and learning process. According to the principal and head of the Foundation, Mrs. Nurul Mukarromah, S.Pd., in addition to general education, the students also need visual learning, such as drawing, designing, and creating artworks. However, some learning methods, such as using videos and presentations, are not yet implemented due to the lack of available facilities and media. The principal and foundation owner emphasized the need for image presentations and animated videos, as these are crucial components of the learning process.

Research on children with intellectual disabilities has been conducted by us previously, such as examining visual perception through drawing on paper to observe participants' difficulties with visual objects (Ruslan, Hidayat, & Logiana, 2021). However, this research needs to further explore how motion visuals can also impact learning. The influence of visuals seems to have a significant effect on fostering creativity compared to general learning methods like basic calculations or theoretical lessons. Therefore, this study aims to observe and analyze the responses of

students with intellectual disabilities to animated videos with two forms of animation: children's songs and character-based animated videos, as a form of play and visual and audio-visual learning for students with intellectual disabilities.

METHOD

The implementation of the community service was carried out through several separate activities. Since the participants are children with special needs, the activities were carefully designed so that the participants could follow and understand the material presented, thereby facilitating various aspects of learning, particularly the introduction of letters, numbers, and shapes. The number of participant's present was 48 students, classified as having mild intellectual disabilities and from different grade levels, specifically grades 4, 5, and 6. The training activities were conducted using the following methods: first, animated children's songs with themes of letter and number recognition were used. Through this animation, children with special needs could learn letters and numbers while playing and singing. Second, the animation was repeated, demonstrated, and explained to assess how well the participants could grasp the message presented.

This study uses descriptive qualitative research to observe and explain accountable events (Aisha & Mulyana, 2019). Asset mapping aims to be used in conjunction with the community to explore their potential and achieve the research objectives, thereby revealing the root causes of issues within a community and uncovering potential solutions (Ruth, Wutich, & Bernard, 2023). Asset mapping itself can serve as an organizational tool for improvement (Moller & Kettley, 2017).

RESULTS AND DISCUSSION

Result

The implementation was carried out in two sessions over three hours, including a 15-minute break. This was done according to the procedures recommended by the educators, who stated that participants with intellectual disabilities need rest periods to help them focus and ensure their physical and psychological comfort. The sessions were conducted outside the classroom using equipment such as a laptop, speakers, and a projector, with three instructors, along with teachers and parents accompanying the participants.

In the first session, we played a children's animated song video from YouTube titled "Lagu ABC Lagu Anak Indonesia" (https://www.youtube.com/watch?v=sLRnGFVQVFY), which has a duration of 0:31 (thirty-one seconds). The second video, also from the same YouTube channel, titled "Abjad Bahasa Indonesia" (https://www.youtube.com/watch?v=uaGJrnthIBo), lasts 1:26 (one minute and twenty-six seconds) and is used for alphabet learning. This animation features a song introducing letters from the beginning to the end, connecting them with nouns. The song was played twice; the first playback served as an introduction for the participants to familiarize themselves with the animation, and the second playback was to assess the participants' ability to follow along with the animation they had just seen.

During the first playback, the participants with intellectual disabilities appeared enthusiastic and were able to focus on the animation. Some children were able to follow the rhythm and content presented through the animation, with the assistance of parents and teachers who participated in the activity. This sense of togetherness created a more comfortable, enjoyable, and controlled atmosphere. There were no major issues observed during the letter introduction animation, except for a few challenges, such as the screen being too small and narrow, leading some participants to compete for a better view of the animated video. However, this issue was resolved by rearranging the space, managed by the teachers and parents.

Next, we conducted the second session by replaying the letter introduction animation to assess the participants' retention. In this session, we observed that the animation was successful, as the participants were able to follow the animated video again without the disruptions seen in the first session, such as the commotion to view the animation. The participants were more relaxed and followed the content of the animated video well. Additionally, the teachers and parents responded positively to the use of this animation in the learning process.
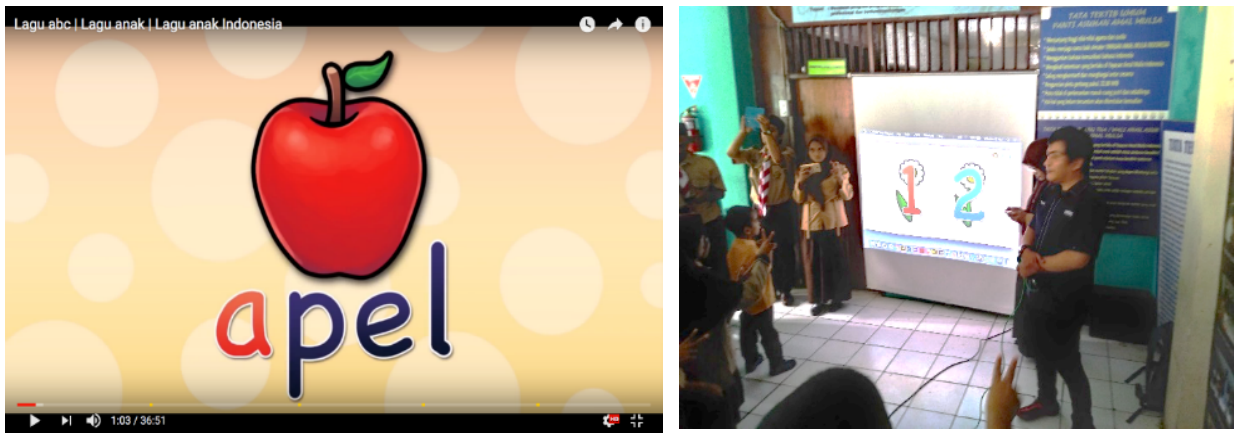
Figure 1. Animated video for recognizing letters (left) and animated video for recognizing numbers (right)

After the first video playback, we gave the participants a break to eat and drink. During this break, we took the opportunity to communicate with the participants, teachers, and parents. We received constructive feedback during this time, such as some parents suggesting that the animated learning program should be enhanced and conducted with more interactive teachers. The use of clear, high-contrast visuals accompanied by music not only makes the learning process more enjoyable but also provides psychological comfort for both the children with intellectual disabilities and the parents who accompany them during the learning sessions.

The second animated video, focused on numbers, was also accompanied by music that created a comfortable atmosphere. However, some issues arose during this playback, such as a lack of focus and understanding among the participants. We identified a few possible reasons for these problems. First, the visualization was not focused enough, as two numbers were displayed simultaneously, requiring the participants to view both at the same time, leading to competition among them for a clearer view. Second, the limited screen size combined with the simultaneous display of two objects made the layout cramped and small, causing participants to move closer to see better. Third, the mixing of images, where the number visuals were combined with other images, resulted in confusion and made it difficult for the participants to observe clearly.

This observation was further supported by the arguments of the educators and parents. While they were able to understand the content, the visualization was quite challenging for the children with intellectual disabilities, potentially hindering their learning process. However, we did not consider this a significant issue because, with proper guidance, the number learning through the animated video proceeded smoothly. One of the successes of the animation was the clear music and voice accompaniment, which made it easier for the participants to hear and follow the learning process. The visualization of the animation in the letter introduction segment had a positive impact on the participants. This was evident when several questions were asked during the video playback, and the participants were able to express what they saw visually. Additionally, the visual elements in the animation were effective due to their focused presentation and key features such as large size, contrasting colors, and consistent layout (with no varying placements).

The next segment involved playing an explainer video, which was also in animated form. This animated video was privately created and can be found on YouTube (https://www.youtube.com/watch?v=UrbwuhYxdko), with a duration of 2 minutes and 20 seconds. The difference from the previous animated videos is that this one uses human characters. Initially, we created this animation as children's entertainment, but we believe it has the potential to be used as educational material for children with intellectual disabilities. Similar to the previous video, this animation focuses on number recognition; however, it combines number recognition with explanations and popular children's songs.

Figure 2. Animated video of learning numbers through the characters Budi and Lulu

The animated video introducing numbers, featuring the characters Budi and Lulu, was played twice. During the first playback, the participants recognized the popular song, which made the learning atmosphere and environment more enjoyable, further enhanced by the lively reactions from both the teachers and parents. This learning process had a very positive impact. Throughout the observation, it became clear that visual learning through characters plays an important role. The participants with intellectual disabilities followed the flow of the animation, imitating movements, recognizing iconic characters, and understanding the differences between the female and male characters.

The main focus during the animation screening was the comments from participants with intellectual disabilities about the characters' cuteness, beauty, or questions about the characters' names. This aspect provided positive feedback and interaction, contributing to learning both personal and group interaction skills. The interaction during this session created a slightly different atmosphere compared to earlier sessions. It was more intense and fostered closer connections among all participants, leading to more interaction and questions. However, this increased interaction also somewhat disrupted the primary learning objective, which was focused on numbers.

We played the second animated video again as part of the participants' memorization process, and what made it interesting was the enthusiasm and requests from the participants themselves. For example, some participants asked for a replay by taking actions such as pulling us to listen to them, pointing at the screen to have it shown again, and even asking their teachers or companions to replay it. We considered this a success in the learning process through the animated video program, making the learning experience enjoyable and interactive, especially for children with intellectual disabilities.

The most important part of the animated video screening process is the comments of mentally retarded participants about the cuteness, beauty, or asking what the animated character's name is. Of course, this section provides perfect feedback and interaction as part of learning interactions between individuals and groups. The interactions that occur build a slightly different nuance than before, in this session the interaction is more intense and provides closeness between all participants so that there is more interaction and questions and answers occur. However, this much interaction can interfere with the main process, namely learning about numbers. We played these two animated videos again as part of the participants' memorization, and what is interesting is the request and enthusiasm of the participants who want it. For example, some participants asked for a replay with several actions such as pulling us to listen to them, pointing to the screen to be displayed again, to asking their teacher or companion to ask to be played again. We also consider this section as a success in learning through the animated video program, so that learning, especially for mentally retarded people, can be done in a fun and interactive way. mentally retarded people perceive and process animation differently from their peers who can see. Understanding how children perceive animation is essential to creating inclusive and accessible learning materials. In this response, we will explore the process of animation perception by children with visual impairments and provide relevant articles on the topic. The process of animation perception by children with visual impairments involves several stages, the first is auditory processing which also relies heavily on their sense of hearing to process information. They use sound effects, music, and voiceovers to understand animation. The second is tactile processing, which some children touch images or graphics to understand animation. The third is cognitive processing, which uses more of their cognitive skills, such as attention, memory, and

problem solving, to interpret and understand animation. The challenges experienced by children with visual impairments in understanding animation can be seen as limited understanding of visual information in understanding storylines or characters. In addition, the reliance on audio descriptions can interfere with the accuracy of message delivery, so that attention can be diverted to other places or objects. Another difficulty is in understanding complex concepts such as abstract ideas presented in animation.

Discussion

Education and learning for children with special needs must be designed as effectively and appropriately as possible. When considering the use of audio-visual media as an educational tool, empirical considerations are necessary. The ability of audio-visual communication to impact visual mental health (VMH) has already been studied by visual communication design experts and is considered successful (Donovan, Furber, Cothren, Andrew, & Gwilt, 2022). However, further research is needed, especially given that the criteria and categories of disabilities, particularly intellectual disabilities, involve visual perceptions that vary from one individual to another. Despite this, audio-visual learning, such as animation, does indeed capture the attention of individuals with intellectual disabilities, making visual and audio elements highly influential in their interaction and engagement.

Several studies have shown that visual stimulation can have a positive impact on children with visual impairments in several ways, such as improving cognitive development, namely visual stimulation can improve cognitive skills such as attention, memory, and problem solving in children with visual impairments. Improving motor skills, Visual stimulation can improve motor skills such as reaching, grasping, and manipulating objects in children with visual impairments. Increasing independence, Visual stimulation can increase independence in children with visual impairments, so that they can perform daily tasks more easily (SANCAR, 2023).

CONCLUSION

Animated videos offer a rich depiction by presenting both visuals and audio, along with movement, iconic elements, and gimmicks through visual forms and characters. Learning for children with intellectual disabilities through animated videos is not only engaging and enjoyable but also fosters positive interaction among participants, educators, parents, and their environment. Visuals play a crucial role, especially when they are focused and well-organized, ensuring that learning attention can be effectively directed. Several aspects that need attention in animated video presentations include ensuring the visuals are focused for better comprehension, using contrasting colors to distinguish between different visuals, and carefully considering the integration of various objects.

The depiction of characters in animated videos also captures the attention of children with intellectual disabilities. These characters create a more enjoyable atmosphere, engage participants through the actions performed by the characters, and become iconic figures that the children follow and remember.

REFERENCES

Alenizi, M. A. K. (2019). Effectiveness of a program based on a multi-sensory strategy in developing visual perception of primary school learners with learning disabilities: A contextual study of Arabic learners. *International Journal of Educational Psychology*, 8(1), 72–104.

Association, A. P. (2000). Diagnostic and statistical manual of mental disorders. *Text Revision*.

Donovan, D., et al. (2022). Visualizing mental health: co-design for innovative mental health promotion prototypes through interdisciplinary collaboration between psychology professionals, communication design students and tertiary design educators. *Design for Health*, 6(2), 163–184.

Erim, G., & Caferoğlu, M. (2017). Determining the Motor Skills Development of Mentally Retarded Children through the Contribution of Visual Arts. *Universal Journal of Educational Research*, 5(8), 1300–1307.

Laila, S. M., & Damri, D. (2023). Meningkatkan Kemampuan Mengenal Huruf Abjad Menggunakan Media Tiga Dimensi pada Anak Tunagrahita Ringan. *Edukatif : Jurnal Ilmu Pendidikan.* 5(2), 1735–1744.

Louk, M. J. H., & Sukoco, P. (2016). Pengembangan media audio visual dalam pembelajaran keterampilan motorik kasar pada anak tunagrahita ringan. *Jurnal Keolahragaan*, *4*(1), 24.

Moller, T., & Kettley, S. (2017). Wearable health technology design: A humanist accessory approach. *International Journal of Design*, 11(3), 1–49.

Mona, G. P., et al. (2015). Study of visual perceptual problems in children with learning disability. *Indian Journal of Basic and Applied Medical Research*, 4(3), 492–497.

Ruslan, A., Hidayat, A. N., & Logiana, A. D. (2021). Persepsi Visual Penyandang Tunagrahita: Studi Deskriptif Olah Gambar Pada Sekolah Luar Biasa Yayasan Amal Mulia. *Ultimart: Jurnal Komunikasi Visual*, 14(1), 67–77.

Ruth, A., Wutich, A., & Bernard, H. R. (2023). The Handbook of Teaching Qualitative and Mixed Research Methods: A Step-by-Step Guide for Instructors. In *The Handbook of Teaching Qualitative and Mixed Research Methods: a Step-by-Step Guide for Instructors*.

Sancar, A. B. (2023). Precursors of Socio-Cognitive Development in Infants with Visual Impairment and in Sighted Controls from 9 to 12 Months.