The Evolution of Vertical Video: TikTok and the 21st Century Children's Interactive Learning Trend

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Abstract: This study tries to discuss how the evolution of vertical video contributes as a learning medium for children in the 21st century. Furthermore, vertical video as learning media refers to the trend of the 21st-century education world, which prioritizes flexibility in learning modes and media. This flexibility also contributes to the increasing massive emergence of contemporary learning media, especially for children, which prioritizes interactivity through the concept of public pedagogy. This study uses a multi-site qualitative. With a literature study of 34 articles covering 21st-century interactive learning from the search databases JSTOR, Taylor Francis, Wiley Library, ScienceDirect, and Google Scholar with keywords: "children's education," "interactive education," and "social media education." Then, a content analysis was conducted to discuss vertical videos as a medium for children's learning on TikTok. The study results show that the evolution of vertical video is good because it is by human ergonomics, which is seen as a vertical creature. Likewise, when he synergizes with TikTok, which gets a good response from children, it becomes a learning medium. On the other hand, TikTok provides opportunities through alternative space and opportunity space for learning media creators and students to collaborate in the scope of digital art, digital creation, and interactive public pedagogy.

Keywords: children education, interactive learning, TikTok, 21st century, vertical video

INTRODUCTION

Since its appearance in the late 19th century, video has undergone many evolutions from a technical, aesthetic, and functional point of view. Especially from a cinematographic point of view, video frames tend to get wider (Clayton, 2022). The trend became even more acute when video experienced resistance from the emergence of television technology in the 50s as a learning medium (Siegle, 2015). Video creators must find ways to differentiate the video viewing experience further. Audiences must be convinced to come to the venue to watch videos (for example, cinema or with a projector) even though they can enjoy audio-visual works at home (Gell, 2006; Hamlen, 2009). There are various formats, such as cinematic or anamorphic, as an evolution of formats designed to present what cinemas or projectors do not have. The evolution is visually consistent, where videos tend to get wider and wider; from 4:3, 16:9 to 2.35:1 format (Cannon, 2018). As an evolution of painting or photography, the video does not necessarily follow the existing standards of freedom from painting or photography. In both fields, we recognize the concept of portrait and landscape. Landscape refers to visual works where the horizontal side is always longer than the vertical side. Portrait means the presentation of the horizontal side is shorter than the vertical side.

Many factors influence this slow adoption. The agreement that the video believed is that two human eyes that form a horizontal line must be the framing guide for a video (Clayton, 2022). An agreement that is not a standard guide in the world of photography or painting. Another effect might be that mainstream video presentations are on a horizontal screen. One might say that the evolution of vertical cinema is a non-existent demand (Graham, 1997). Massive and expensive infrastructure overhaul is required if vertical screens are accommodated. It can be concluded that

the first 100 years of video evolution have been unable to break video works' horizontality (Figueiredo, 2015).

At the turn of the millennium, there have been many evolutions in digital technology. On many fronts, digital technology offers new and new possibilities, including how video in learning media functions is enjoyed vertically (Clayton, 2022; Marfil-Carmona & Chacón, 2017; Ui et al., 2022). This is supported by developments in 2009 with the emergence of the Nikon D90, the first DLSR camera that can record video. Digital cinematography is increasingly democratized; almost anyone can now create visual achievements that previously could only be created using expensive film cameras. Meanwhile, there has been an extraordinary evolution in another line of technology, especially in communication. 1983 was the beginning of the emergence of mobile phones, initiated by the Motorola DynaTAC 8000X model; then, in 1994 was the appearance of the first smartphone Simon Personal Communicator from IBM (Chalk, 2018; Graham, 1997; Harkema & Rosendaal, 2020). It took more than a decade for the technology to be cheap and available at an affordable price for ordinary people. The development of digital chips that the author mentioned earlier greatly influenced the development of smartphones. 1999, the end of the turn of the millennium, was the year when digital cameras were integrated with smartphones through the production of the Kyocera Visual Phone VP-210 (Chalk, 2018). The democratization of cinematography through DSLR cameras and smartphones that can record video is a new wave in the world of videography. Anyone can make videos in the context of entertainment or learning. The emergence of social media further strengthens this, especially TikTok, where anyone can create content both creatively (entertainment) and learning content (De Leyn et al., 2022; Stahl & Literat, 2022; Wiratmoko & Sampurno, 2021).

Concerning learning content through TikTok, smartphones as devices have now been seen as mandatory items based on needs and lifestyle. Smartphones are also seen as being able to replace many things, notebooks, telephones, portable audio players, cameras, and most importantly, in this discussion, video cameras. At first, the Kyocera Visual Phone VP-210 could only record ten photos before the memory was full (Amez & Baert, 2020). Anything that can record photos in time can undoubtedly record videos. The same is the case with DSLRs. The rapid development of digital chips allows for more efficient data storage. Smartphones are ergonomically designed to be gripped. Iterations before smartphones showed that smartphones were designed to be operated with one hand in a vertical position. Although some functions finally force it to two hands. Smartphones -- because one-handed gadgets -- are operated vertically are still the standard of operation. So this is where a new possibility is created. A custom that opens up the evolutionary possibilities of video presentation frames. Vertical video is now here as an answer to the evolution of video horizontality challenges, such as those that have appeared in painting and photography (Clayton, 2022; Ui et al., 2022). Being present and developing does not necessarily come from the world of film or cinematography, but in 21st-century children's learning videos collaborate with social media, TikTok. Not a few learning videos are made for TikTok; it marks the emergence of content creators who do not care if they will be called video makers, further enriching and strengthening the vertical video position.

Therefore, this study discusses how the evolution of vertical video contributes as a learning medium for children in the 21st century. Vertical video as learning media refers to the trend of the 21st-century education world, which prioritizes flexibility in learning modes and media. This flexibility also contributes to the increasingly massive emergence of contemporary learning media, especially for children, which prioritizes interactivity.

METHOD

This study uses mixed methods oriented to multi-site qualitative (Leavy, 2017; Lune & Berg, 2017; Somekh, 2006; Tashakkori & Creswell, 2008). This model was used because the researcher wanted to get exploration and discourse in more detail. The initial data used literature studies and

content analysis, strengthened by survey data (Leavy, 2017; Tashakkori & Creswell, 2008). Multi-site qualitative oriented using a literature study approach is used together with a content analysis approach related to the evolution of vertical video and its discourse in TikTok learning media. The literature study was obtained from a systematic review of 34 articles covering 21st-century interactive learning from the search databases JSTOR, Taylor Francis, Wiley Library, ScienceDirect, and Google Scholar with keywords: "children's education", "interactive education", and "social media education". The data obtained are also strengthened by a survey on the use of social media in learning conducted on 100 elementary school students in Yogyakarta, taken in July 2022. After the research data was collected, data analysis was carried out by discussing the evolution of vertical video, interactive learning, and public pedagogy through social media, in addition to a literature review by comparing and reviewing theories related to vertical video as a medium for children's learning through TikTok (Clayton, 2022; Gell, 2006; Heyang & Martin, 2022).

RESULT AND DISCUSSION

TikTok is a social media and music video platform from China that launched in September 2016. The app allows its users to create short music videos. Throughout the first quarter (Q1) 2018, TikTok established itself as the most downloaded application, with 45.8 million downloads, to be exact (Stahl & Literat, 2022). TikTok beats common apps like YouTube, WhatsApp, Facebook Messenger, and Instagram. This is in line with the characteristics of the 21st century, which can be called a period of technological progress, which has entered a world that is close and close to technology in making work easier (Colman, 2018; Du et al., 2020; Yang & Ha, 2021)
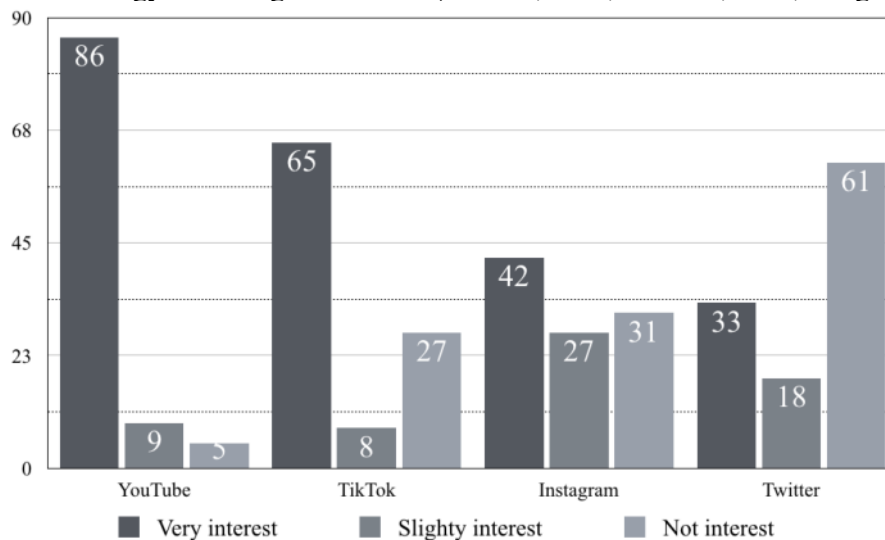

Figure 1. Digital natives students' interest in learning using social media platforms (Survey from 100 elementary students in Yogyakarta, July 2022)

One of the things that are made more accessible is the aspect of education and learning innovation (Y.-J. Lee, 2022). Speaking of learning, children must learn to read carefully, type, count, and speak. Furthermore, in the spirit of learning, these activities will make children see the details of the object being studied by analyzing, identifying, and finding the best solution to a problem (Stahl & Literat, 2022; Zeng & Abidin, 2021). Regarding learning and TikTok, it is also one of the video applications that people often use to record videos with a duration of 3-5 minutes. TikTok is not as popular as YouTube, but TikTok is effective in delivering vertical learning videos (Figure 1). Furthermore, when viewed with the hashtag *#samasamabelajar*, there will be a lot of learning content on TikTok as learning in the world. This shows how TikTok has now

become part of the instructions one can learn from studying general information about a particular discipline (Figure 1). The addition of effects, music, and the freedom to be creative makes children who previously did not use this application want to use it too. That makes children interested in using video applications that fall into this vertical video category (Figure 2).
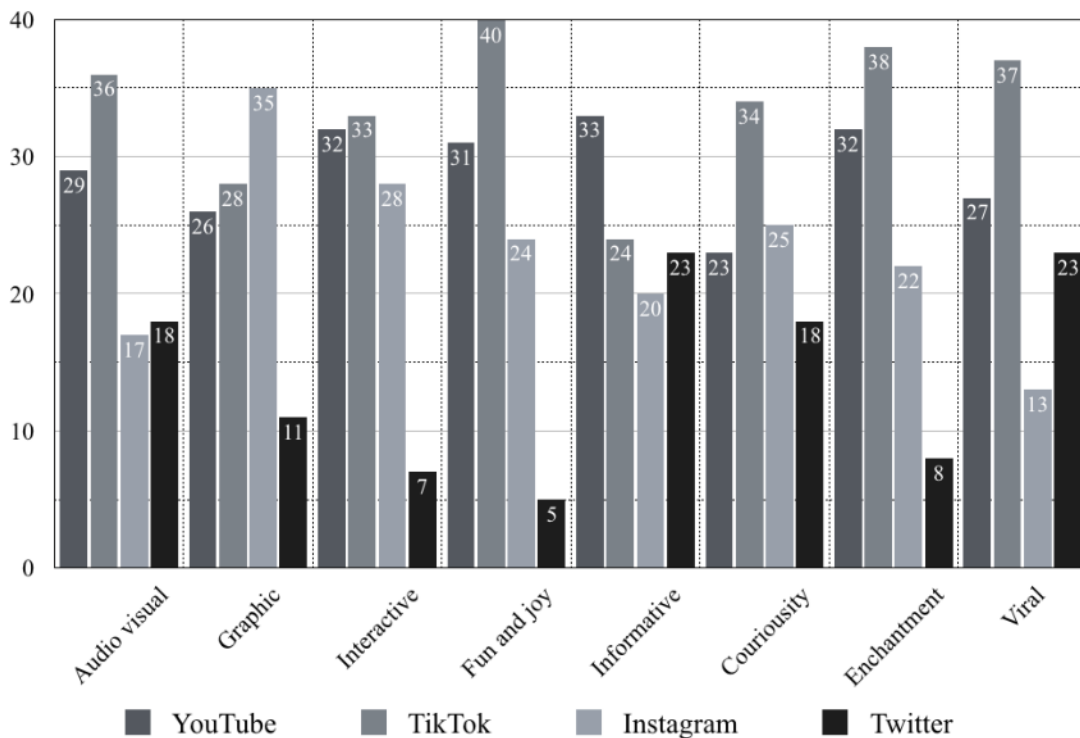

Figure 2. Interrelation between factors in social media platforms for (art) learning (Survey from 100 elementary students in Yogyakarta, July 2022)

TikTok, in the evolution of vertical video as a learning medium, has now been accepted as a form of learning media (De Leyn et al., 2022; Weimann & Masri, 2020). Vertical video as a learning medium can be good or bad and can be judged on its usefulness and artistic content (Figure 2). Vertical video makers as learning media have the same degree as painters or sculptors. It is dangerous if vertical video makers as learning media produce something that is out of shape or has no aesthetic value. The main subject of the instructional video is still an individual who visually is a vertical creature. However, the film frame before the arrival of the vertical video was still horizontal with all its variations (Figure 2). Even though the demand for vertical videos is increasing (strengthened by TikTok as a social media that seems to be designed for the verticality of images and presentations), there is a very significant lack of literacy about how vertical videos should be produced (Slota et al., 2018; Stahl & Literat, 2022). This shortcoming also covers instructional materials in their narrative, composition, and cinematography implementation in making vertical videos as learning media. Furthermore, in the 1920s, Sergei Eisenstein stated that we are submissive and obedient to horizontalism and will submit even more (Eisenhauer, 2006; Giroux, 2003). That statement proved true for the next 80 years.

TikTok, as a platform for the evolution of vertical video as a medium for children's learning, is transformed into an alternative space for digital art in deconstructivism (Wang et al., 2022). Suppose it is associated with art, as the origin of vertical video. In that case, the discussion of digital art in the realm of contemporary art utilizes the principle of freedom of work to occur over the role of the creation of works of art as a medium of learning. Vertical video as a learning media is played with programs provided by the digital system (Kim, 2020). Therefore digital technology is the Juggernaut in governance, copyright, and performance, primarily through the TikTok algorithm (Kasiyan, 2019). The index for the increasing role of social media is when a vertical

video as a learning medium is the result of computer editing through software to produce new works of art, such as animations and 3D renderings, as well as video image manipulation and in the form of fractal art (algorithmic art) (Cruz, 2019; Roland, 2010; Villamizar, 2018). Furthermore, this development also targets the creation of learning media based on moshing data, mobile art, dynamic painting, 2D and 3D computer graphics, pixel art, digital photography, digital collage art, 2D and 3D digital painting, vector manual drawing, and integrative art as the form of mixed media between learning editing modes that are hybrid with others (Hudson, 2020; Janse van Rensburg, 2018; Yıldırım, 2020).

The evolution of vertical videos used as learning media and uploaded on TikTok is one form of postmodernism learning media for children. It is based not solely on intellectual engineering but also on software technical sensitivity. Moreover, learning media for children utilizes rides, creative tools, and media that are very popular for today's children, namely digital technology-based. Vertical videos as children's learning media change knowledge management towards algorithms by departing from the idea of 'demitology and deconstruction' (K. Lee, 2017; Patton, 2013).

This refers to the concept of deconstruction, which rejects the idea of structuralism in any sense; giving meaning is given objectively according to what is there. This idea is to fight the logocentrism tradition of structuralism, which prioritizes structuralist currents, conventions, and canons in manufacturing conventional learning media (Cannon, 2018; Patton & Buffington, 2016). A vertical learning video display removes the barriers of forms, ideas, and appearances that conventional ideas limit. As a logical consequence, children as users of vertical learning videos on TikTok are free to give meaning to the media offered (Radianti et al., 2020). It is even easier for creators of learning media to create them digitally by mastering the TikTok application.

The development of learning media for children in contemporary times utilizes virtual space. Its use is not only for developing learning media but also for displaying interactive works and presentations among students by utilizing tagging and hacking directly in a virtual space (Cayari, 2018; Lu, 2010). Digital learning media are no longer static by material and formal considerations and analysis but result from changes in form based on free expression and digital technology capabilities. In this regard, digital developments encourage creativity, digitalization with IoT principles, and arts with the freedom of epistemological, demitological-deconstructive, interactive, and participatory learning media boundaries (Guerlac, 2013; Johnson, 2014). This trait will provide opportunities for the plurality of the meaning of space and time as a learning medium for children.

Given that in learning, children need to strengthen the position of human dignity based on feelings and thoughts. Feelings and thoughts as human beings become the primary basis of expression. When a vertical video of learning media is present and gets reviews or reviews from users or audiences, they will comment in the form of tagging, changing words in the form of a taste reaction (Li et al., 2016). Here the function of visual language is raised where 'vertical video as art, learning, and language' (Villamizar, 2018). Children as users and audiences can review vertical videos of learning media at a distance (based on different spaces or distances seen by geographical position), which with this virtual space becomes close. They communicate with each other via the screen. This communication justifies the presence of children based on communication represented through figures representing words and sentences (Milyakina et al., 2020). In this case, someone's ideas will be poured out at once in visual communication.

Vertical videos of learning media uploaded on TikTok know no distance, with the ability of digital technology to respond to the form and background of creation. Vertical videos of learning media through tagging and hacking are children's rational thoughts through hacking, tagging ideas and their meanings. This freedom rejects the metaphysics of the presence of objects even though vertical videos of learning media are self-extensions of both creators and children in their avatars (Charman & Cahill, 2012; Taner Derman et al., 2020). The meaning of vertical video learning media as self-reflection and representation still applies.

Epistemologically, tagging vertical videos of learning media rejects the metaphysics of presence and academic presence that has been running in the mainstream, becoming a common form of learning media for the community. The freedom of vertical video creators in learning media has turned into an opportunity space that is used as a space for dialogue (Dennis, 2015; Sampurno et al., 2020). This opportunity space is where there is a unity of thinking time between vertical videos of learning media and children as a learning process. This is where the children also become creators indirectly, with their dialectic in responding in the form of comments, likes, shares, or tagging (Holt et al., 2013).

Visual communication patterns elevate the unity of space and time in interactive learning media. Virtual communication in the virtual space will occur by interacting and having disagreements between vertical videos of learning media and children as part of the participatory art education concept (Krasny et al., 2010; Tisdall et al., 2021). Participatory art education invites children to play a role in creating learning media, even the presence of learning media, thanks to the collaboration with children (Nuroh et al., 2020). The presence of the participants in the virtual public space (rides and media) as an alternative space for thinking as well as a social space and sociability of children within the scope of 21st-century learning. This refers to the 'space,' which is the distance between the creator and the user's dialogue; it is also an opportunity to contemplate between them (as an alternative space) (Jules, 2022).

Space can be interpreted as a space for imagination and contemplation. In this alternative space, vertical videos of learning media and children play a role in their respective dialectics. Dialectics is a distinctive style buried in one's memory and derived from technical knowledge and the idea of creation with freedom of opinion between the creators of learning media and children that are indirect and transcendental (Fott, 2009; Kearns, 2019; Locke, 2015). When TikTok becomes a space for children's imagination and contemplation, the formal logic of thinking tools will produce material logic.

Formal logic is a human effort to find a problem's structure, system, and path, as well as problem-solving methods (Inhelder & Piaget, 1958; Savoie, 2017). Children find concepts, decisions, conclusions, and evidence regarding their logical structure in this formal logic. Abstraction is said to be realistic, seen from the growth of thoughts that dominate the ways of obtaining ideas and ideas and the content of the relationships between them. The formal logic of children when enjoying vertical videos of learning media on TikTok is in the selection process and restructured as metadata stored in their memory. The data in this memory will come back automatically through its habituation ability (Bourdieu, 1984). Drawing conclusions from each part is related to its contents so that pictorial thinking is realized to create a new symbol and sign.
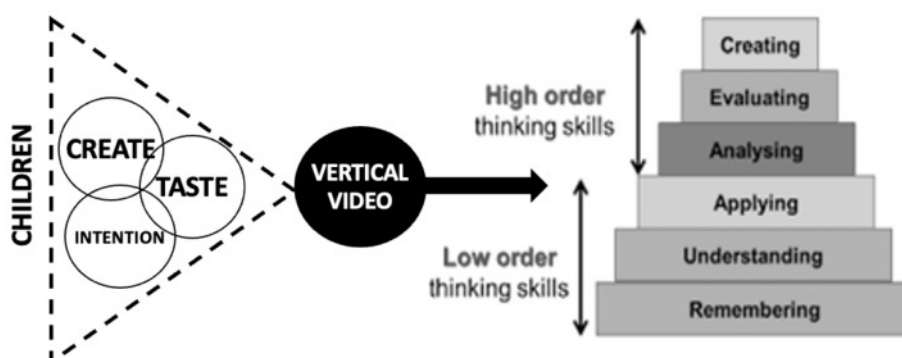

Figure 3. Vertical video on Higher Order Thinking Skills (HOTS)

The logic devices of children who learn through vertical videos of TikTok learning media can start from material problems, where they strengthen their logic to find the 'meaning of shape'

of an object. From the aspect of creation, taste, and intention, vertical video has a context to better direct children towards High Order Thinking Skills (HOTS) (Figure 3). The meaning of the intended form is a sign in the form of a symbol of ideas and ideas resulting from contemplation. Material logic is an initiating step and a connotative phenomenon; children's minds hang forms and meanings. They are thinking about structure or form as an abstraction to conclude. Through it all, children's cognitive abilities are tested. The vertical video learning media on TikTok encourages intellectual debate to increase effectiveness by comparing children's reasoning (Figure 3).

Based on epistemology, the vertical video visuality of learning media on TikTok, giving meaning to an object, depends on the children as the audience (Bonnett, 2017). So, likes and dislikes give different meanings to each child. Children's knowledge abilities affect the reading of symbols and a review of the shape, meaning, and use of visual symbols represented in vertical videos of TikTok as learning media. From here, the aesthetics of the forms packaged in the vertical videos of learning media have different meanings. Next, the children provide comments and change them according to their dialect. Shifts in meaning may occur because children have a unique sign-reading system.

On the other hand, the vertical video of learning media on TikTok in formal logic will strengthen his unique opinion, which occurs when deconstruction is based on demitology (K. Lee, 2017). When children do hacking and tagging, this affects people from different backgrounds. This is because TikTok is a virtual space and a public space for learning with its dual style, is a space for children's thinking in responding to learning media. Vertical videos of learning media caught by the eye are transmitted by thoughts and feelings as visual data, while non-visual data is stored in large memory. This object is in the form of visual and non-visual forms that are abstract but real. Abstract, because the object is in the form of 'formal data' such as events, principles, and ideas, which are then converted through neuroaesthetics into memory particles (Remley, 2017; Willis, 2007). Children will reveal this memory in the form of dialectical symbols. This understanding is a logical process to find visual symbols in vertical videos of learning media extracted as knowledge.

The evolution of vertical video as a learning medium on TikTok further emphasizes 4+1c in 21st-century learning. This refers to learning media that must continue to develop because it must follow technological advances that can be used anytime and anywhere, making it easier for students and educators to follow the learning process. In 21st-century learning, learning media is an indispensable main component where all educational activities are carried out in alternative spaces. The development of technology that continues to innovate has helped progress in the field of education, one of which is producing electronic-based learning media called e-learning, which strongly supports the existence of vertical videos as learning media.

E-learning can facilitate the implementation of learning where learning becomes more flexible, cost-effective, and can be done anywhere and anytime. The development of e-learning in technological advancements in learning media has become more varied, especially with vertical videos and TikTok. Vertical videos and TikTok are currently very popular with the public, especially children and Gen-Z, who are very attached to the digital world. They are more likely to look at social media than to see learning materials or follow lessons because social media displays content that attracts more attention than learning. Therefore, educators can use social media as a learning medium because social media has its enchantment that can motivate learning and affect learning achievement (Castaño-Muñoz et al., 2014; Hendy, 2020; Thomas, 2020). Social media always provides updates in the form of the latest information that is fully explained and can be accessed anytime and anywhere.

Facilities on social media have similarities with learning facilities so that educators can use social media as an alternative learning medium and support learning skills in the 21st century. The TikTok application is a social media used during this pandemic for educators and students to entertain and seek information and knowledge. Tiktok displays vertical video content with various themes, one of which is about the theme of education, where students can gain knowledge from

the various vertical videos available. Tiktok has an attraction that can provide learning motivation to students by facilitating understanding by providing objectification and pictorial thinking constructions that are better than conventional learning media.

CONCLUSION AND SUGGESTIONS

The evolution of vertical video follows the development of learning spaces into the realm of virtual public spaces. The evolution and development of learning media into the digital realm includes the development of space for thinking, contemplating, and imagining interactively in gaining knowledge. The interactions include active communication through learning media development on the TikTok social media platform. Therefore, vertical video as a learning media becomes interactive by being present with collaboration between children and teachers and passive communication, embodied in interactive learning media.

The content of learning media creators plays an aesthetic value that departs from the logic of the material and then rearranges it as a tagging and hacking performance. Material aesthetics is more directed to metacognitive abilities based on deconstruction. The principle of deconstruction is a resistance to the metaphysics of presence which is an academic principle. Therefore, the presence of vertical video as a learning medium through TikTok is straightforward by strengthening digital and fractal performance and presenting alternative space aesthetics. Alternative space aesthetics put forward the algorithmic principle to reconstruct forms and re-express, which children as students like.

Simply put, the value of fun is the beauty that lies in the evolution of vertical video as a learning medium on TikTok. Beauty is subjective; thus, alternative spaces show individuality as a positive response to the emergence of the learning media. The evolution of vertical video as a learning medium on TikTok can be enjoyed both by the creators themselves as a reflection and by children as users and students. So, when interest in learning media arises, in the alternative space, there is a visual communication between knowledge and students by interacting with each other through discussion of symbols and or markers. The interaction collides with the concept of knowledge; beauty is pure reasoning through understanding, then built by beliefs and estimates of the object of knowledge.

This research is limited by a lack of empirical evidence, challenges in generalizability to different contexts, concerns about content quality and reliability, ethical considerations regarding children's privacy, and uncertainties about long-term impact and sustainability. Further research is needed to assess the effectiveness of vertical learning videos, address content quality control, ensure ethical practices, overcome accessibility barriers, and understand the long-term implications of using TikTok as an educational platform.

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