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An Analysis of AI-Generated Teaching Videos: Color, Language and Their Application in ASD Education

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Abstract. Children with Autism Spectrum Disorder face significant challenges in social interaction, communication, and learning. Their unique information processing styles and sensory differences often hinder the efficiency in traditional teaching. AI, as a popular tool applied in different field today, has proven its feasibility in producing videos towards education. This paper aims to figure out the feature of image and language style in videos produced by AI as well as the effects when giving lessons to the children with ASD. This paper employs a method of case analysis. The author input my needs of giving lesson to ASD children into Deepseek to obtain the copywriting and put them into Jianying to generalize the videos for teaching. Through Experimental Research, This paper analyzes the video in two aspects: colour and language style and figure out if AI is good at meeting the needs of teaching ASD children. The paper concludes that color and language each play a considerable role in the educational process, and their synergistic effect effectively compensates for the limitations inherent in each individual element.

Keywords: ASD, education, color, language

1. Introduction

In recent years, the education of children with autism spectrum disorder (ASD) has attracted widespread global attention, and various teaching theories have been applied in this field. Among them, inclusive education (placing children with ASD in regular classes for teaching) is still in the exploration and development stage with a fixed pattern [1], whose core includes two meanings: first, children with ASD can live equally and receive appropriate education in ordinary environments (e.g., primary schools); second, they can live an equal, friendly and comprehensive life in social environments (e.g., communities) [2]. In addition, Peer-Mediated Intervention is used to improve the social abilities of children with ASD, that is, researchers train ordinary children in social skills and guide them to establish appropriate social patterns with children with ASD [3]. Multimedia teaching has been widely applied in the education of children with ASD, which can provide multi-sensory support, improve their attention and participation, and promote the development of social, language and cognitive abilities.

However, the application of multimedia teaching in the education of children with ASD still faces challenges: first, at the technical level, the cost of developing courses tailored to the cognitive and

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sensory characteristics of children with ASD is high, and individual differences need to be taken into account; second, there are concerns about learning generalization.

This study adopts a case analysis method to explore the adaptability of artificial intelligence (AI) to the needs of children with ASD by analyzing the color and language style of videos, so as to provide a reference example for the research on the application of AI in this field.

2. Literature review: etiology and intervention of autism spectrum disorder

To date, the etiology of autism spectrum disorder (ASD) has been disproven to be associated with inappropriate parent-child relationships. Autism is currently recognized as a complex neurodevelopmental disorder caused by the interplay of multiple factors, including genetics, brain mechanisms, cognitive neural functions, and environmental influences.

From the view of cognitive neuroscience, ASD is attributed to deficits in executive function, information integration, and theory of mind. With regard to neural mechanisms, abnormalities in brain structure, social cognition-related brain regions, and neurochemistry may contribute to the pathogenesis of ASD. Environmental factors cannot be entirely excluded, yet empirical evidence remains limited. The previously hypothesized association between measles vaccination and autism has not been validated. The links between developmental regression in affected children, environmental pollution, and ASD remain controversial, with no conclusive and reliable research findings. As a critical etiological component, twin studies have demonstrated that the heritability of ASD exceeds 90%, and the prevalence among relatives is significantly higher than that in the general population. ASD follows a polygenic inheritance pattern rather than being caused by a single gene, while a small number of cases are related to chromosomal abnormalities [4].

Interventions for ASD can be broadly categorized into four types: family and educational interventions, technological interventions, behavioral training interventions, and medical interventions. As the most fundamental and core approach, family and educational interventions aim to comprehensively improve the abilities and emotional regulation of children with ASD through the construction of family-centered support systems, mixing music therapy, art therapy, and play therapy. Technological interventions employ modern assistive technologies, such as speech-generating devices (SGDs), social robots, virtual reality (VR), and sensory integration therapy (SIT). Behavioral training interventions enhance social and responsive skills through standardized procedures (instruction–modeling–practice–feedback) and incorporate dynamic materials including audio, video, and animation to optimize intervention effects. Finally, medical interventions include pharmacological treatments (both Western and traditional Chinese medicine) and gastrointestinal management, as gastrointestinal dysfunction has been found to exacerbate behavioral problems in children with ASD [5].

3. Analysis in colour

3.1. Color preference

According to the research of color preference of autistic people, The arrangement of colors in the environment will affect children 's color cognition, attention, imagination, emotion and even personality development, which proves the importance of visual aids [6]. And On the whole, autistic children 's preference for cold color is better than that of warm color. The order of color preference is: green, blue, red, purple, orange, yellow [7].

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3.2. Methodology

This paper will design commands for generating educational videos for children with ASD. For instance, a typical command is: "Create a 30-second video to teach children with autism shape recognition. Requirements: adopt soft, non-dazzling colors; use simple visuals with non-distracting backgrounds; apply short, clear and specific sentences with slowed speech; avoid metaphors and abstract vocabulary." Jianying, one of China's mainstream and well-known content creation platforms, is selected as the video production tool. To collect research data, screenshots of the video at different time points are captured for image analysis, with images collected every 5 seconds as experimental materials.

3.3. Results

Table 1. Data of colour proportion in the video

Time Stamp	Green	Blue	Red	Purple	Orange	Yellow
1-5s	35%	15%	8%	1%	2%	3%
6-10s	1%	18%	10%	0%	0%	0%
11-15s	5%	15%	10%	0%	0%	1%
16-20s	3%	18%	12%	1%	0%	2%
21-25s	0%	16%	10%	0%	0%	3%
26-30s	45%	20%	8%	0%	0%	2%
31-34s	0%	22%	10%	0%	0%	2%

In Table 1, the mixture of color demonstrates remarkable uniformity and scientific rigor. The video avoids using improper colors while designing images in giving lessons. As dots in the video, purple, orange and yellow only occasionally appear, accounting for less than 3% in average. The restrained use of these colors avoids potential sensory risk of caused by highly saturated colors, while maintaining children's interest through changing colors, which aligns with the need of low stimulation and little changes.

Blue, ranging from 15% to 22%, serve as a soft cool color running through the entire video, its stable proportion meets autistic children's need for "predictability". It balances the warm-toned background without triggering anxiety due to color changes. Red (8%-12%), as the core visual focal color, its stable proportion forms a clear visual anchor in the low-stimulation background, effectively guiding autistic children's attention, helping them focus on teaching props and interactive behaviors, and improving information reception efficiency.

Green seems to be more fluctuated, but it is reasonable. High proportion of green only appears in 0-5s and 26-30s, and are light warm green rather than high saturated green, helping transit the scenes.

4. Analysis in language style

Cognitive load theory, suggesting that our memories can be divided into working memory and long-term memory. Among them, working memory has limited capacity, allowing us to store 5-9 information or information blocks at a time [8]. However, according to recent research, autistic

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children only have a storage of 2-3 blocks, and most of them are more likely to be fulfilled, so the teaching materials should be of low loading.

Apart from that, autistic children share the problem of weak language comprehension and struggles with abstract, vague and metaphorical language. The essay has shown that…

And they also feature high anxiety in response to uncertainty and sudden changes.

So the core goals of instructional language for autistic children are clarity, predictability and low cognitive load.

According to the Core Goals of Instructional Language for Children with Autism Spectrum Disorder, the paper also design Quantitative Analysis Tables (Table 2, 3 and 4) of Instructional Language & Speech for Children with Autism Spectrum Disorder.

Table 2. Quantitative table: Clarity(30)

No.	Evaluation Item	Score (1-5)	Evidence & Examples
1	Sentences are short (≤8 words per sentence)	5	Four corners. This is a triangle. It's like a sandwich.
2	Clear pronunciation, moderate speed, no slurred speech	3	The video is a little bit fast, making it difficult for autistic children to understand
3	Key words emphasized and repeated	5	This is a circle. It's like the sun. Circle. Touch it. It's round. Round.
4	No irrelevant talk, filler words, redundant expressions	5	The words are all relevant to the knowledge in the class.
5	Instructions are clear, no vague or double-negative statements	5	Find the circle. Now find the square.
6	Instructions repeated only 1–2 times, not overstated	5	No repetition. All instructions are given only 1 time
Total	—	28	

Table 3. Quantitative table: predictability(30)

No.	Evaluation Item	Score (1-5)	Evidence & Examples
1	Language follows a fixed structure (beginning–process–end)	5	Language follows a structure of recognizing, describing and choosing.
2	Consistent transition phrases (e.g., "Next we will…")	1	No transition phrases or words.
3	Stable speech rhythm, no sudden loud or fast speech	2	The video performs the words in rapid speed.
4	Consistent questioning style, no sudden sentence changes	5	The instruction are consistent though there is no question.
5	Previews next activity (e.g., "First… then…")	3	No previews, but the teaching process remains steady
6	No sudden questions or startling language	5	With thorough foreshadowing, the question arises naturally rather than abruptly.

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Table 3. (continued)

Total	—	21

Table 4. Quantitative table: low load(30)

No.	Evaluation Item	Score (1-5)	Evidence & Examples
1	Low language quantity per unit time, no continuous talking	5	Each unit contains a few words
2	Sufficient wait time for child (≥3 seconds)	1	The wait time is only around 2 seconds between lines.
3	No complex sentences or abstract metaphors	5	Sentences are simple sentences and the figure of speech are simile.
4	No multiple instructions at once (avoid "first… then… then…")	5	Xiaoming, find the circle. Now find the square.
5	No rhetorical questions, blame, or emotional language	5	Words are simple and clear.
6	Language focuses only on current task, no off-topic speech	5	Words are quite relevant to tasks.
Total	—	26	

The charts illustrate high clarity and low cognitive load, which is quite friendly to autistic children. The language is short, clear, repetitive, and task-focused, with concrete examples and visual supports. But the speed of the words makes it difficult for children to react or understand the meaning. This is one of the flaw in the video.

More than that, predictability is the biggest weakness. The lack of transition phrases, fast speech rate, insufficient wait time, and absence of activity previews greatly reduce the stability and predictability that autistic children need.

Wholly speaking, the language design in video is effective but needs further improvement, especially in rhythm, transition and waiting time to better support their participation and thinking.

5. Analysis of the synergistic effect between language and color

It is evident that both color and language play a crucial role in videos designed for children with autism spectrum disorder. Furthermore, their synergistic effect effectively compensates for the limitations inherent in each individual element.

In terms of clarity, the two elements reinforce each other: concise and explicit sentences, when combined with color-based auxiliary cues, alleviate the cognitive burden on children with ASD in language comprehension. Regarding predictability, despite the inadequacy of linguistic transitions, color serves as an effective compensatory mechanism for the lack of predictable linguistic signals. Specifically, each shape is assigned a distinct color; even in the absence of transitional sentences, children with ASD can utilize color cues to anticipate the subsequent shape to be introduced.

Finally, in terms of cognitive load reduction, color and language form a structured input mode characterized by "one linguistic concept + one distinct color = single-channel input". This mode enables low cognitive load through simple and targeted input, such as "rounded edges, red (circle)", thereby optimizing the information processing process for children with ASD.

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6. Discussion: challenges and future directions

Based on the above literature review and empirical case analysis, this study draws the core conclusion that videos generated by AI tools are not yet suitable for direct application in educational settings for children with autism spectrum disorder (ASD). Although existing cases have fully confirmed that AI-generated videos present significant advantages in terms of visual presentation—their color design precisely matches the visual preferences of children with ASD, and the visual support system is highly compatible with the cognitive characteristics of this group. Meanwhile, the standardized presentation of video content, as well as the repetition and structural integrity of language expression, can reduce the cognitive load of children with ASD, help them predict the progress of teaching content more clearly, and provide certain technical support for educational implementation.

However, it should be clarified that current AI-generated videos have obvious deficiencies in language expression: first, the lack of transitional words and excessively short inter-sentence intervals lead to an overly rapid pace of information transmission, which not only increases the cognitive burden on children with ASD but also hinders their in-depth participation in teaching and ability to keep up with the content progress; second, the mechanical audio intonation weakens the sense of immersion in the teaching context, resulting in an obvious deviation from the emotional and humanized communication needs of children with ASD. These problems jointly limit the feasibility of their direct application in educational scenarios.In response to the above issues, this study proposes the following optimization suggestions:

First, clearly incorporate the core requirements of "supplementing transitional words" and "extending inter-sentence pause time" into the prompt design for AI video generation, so as to adapt to the language and cognitive rhythm of children with ASD through prompt optimization.

Second, pause appropriately during teaching according to students' comprehension, reserving time for content digestion and interactive feedback to enhance teaching effectiveness.

Third, after video generation, post-editing techniques can be used to replace the original audio with more emotionally warm and naturally intonated human voiceovers, so as to improve the vividness and humanization of language expression and strengthen the situational immersion of children with ASD.

7. Conclusion

This study aims to investigate the roles of color and language in AI-generated videos for children with autism spectrum disorder (ASD). The findings indicate that color and language each play a considerable role in the educational process, and their synergistic effect effectively compensates for the limitations inherent in each individual element. This study holds significance for the field of applying AI tools in specific educational contexts.

However, this study has one potential limitation: the sample size may affect the generalizability of the findings, which, I believe, can be addressed in future research. Future studies could focus on the subjective perceptions of children with ASD and shorten the image units to 3 seconds or less.

Overall, this study provides new insights into the integration of AI tools and specific education, and highlights the importance of color and language in the teaching process.

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