Amazon Glow: Evaluating commercial screen-based devices for children's connection and engagement with remote contacts

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Fig. 1. Using Tangram Bits included with the device bundle to complete the animated puzzle

With the surge of digital devices with children as primary users, it is important to see how commercial devices which are developed for children as primary users live up to their design claims. This paper presents a review of Amazon's newest "Glow" device to the test, which aims to bridge physical distance between children and their remote family members. It concludes with rounding up the strengths and limitations of the overall user experience after using the device for five months.

CCS Concepts: • **Human-centered computing** → *Child-Computer Interaction.*

Additional Key Words and Phrases: child-computer interaction, Amazon Glow, interactive devices, review, remote connection

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1 INTRODUCTION

Parents in recent times have been reliant on using digital technology as a parenting assistant and a means of distraction for children [2, 3]. With the growing number of interconnected screen-based devices and voice interfaces being used inside home, parents have been more receptive to their children's use of these devices for entertainment, education, and connection with family [4, 9]. Their use has been more prominent in the recent past, where parents found themselves in circumstances where they had to be confined at home with children for extended periods of time, where these devices aided them in performing a variety of family-oriented and child-oriented activities [4, 6]. Considering the growing positive attitudes and reception of these devices by the parents, I wanted to put Amazon's newest "Glow" device to the test, which aims to bridge physical distance between children and their remote family members.

Debuted in September 2021, Amazon Glow is Amazon's newest child-friendly device with projected space and camera, that allows young children to communicate with a remote loved one in a way which feels more immersive than a traditional video call using a smartphone or tablet device. This device is designed children aged 3 year or older, and hosts a variety of games, books, and art to engage children while they communicate with their remote family members. The device hosts only content suitable for kids through a subscription to Amazon Kids+, and activities supervised by trusted adults through parent approved contacts and Amazon Parent Dashboard. The shuttered camera also allows parents to restrict a child's view and voice by disabling the camera and four microphones when they deem appropriate. The glow device is not enabled by Alexa [8] or compatible with Echo Glow, which ensures that the voice and video interactions are not recorded or stored on the cloud.

Amazon Glow makes the linear experience of audio or video chatting come to life with its unique features which claim to blend the physical and digital worlds together. The device bundle includes seven *Tangram* puzzle pieces of varying sizes, which can be used to complete a variety of puzzles. The children may choose the puzzle they want to solve with the help of the remote loved ones while they assist and cheer them while they complete it. The puzzles are designed to provide a suitable challenge for young children, with a hint feature to assist them whenever they get stuck. At the end of the puzzle, the object comes to life making the experience delightful for the child. The device also allows children to convert their favorite toy or object into a digital image/sticker to be used within an art activity or for merely being amused by seeing the object turn incorporated into the activity. The children can also read, play, draw, and participate in several activities using a large repository of books, games and puzzles provided with the device through a subscription to Amazon Kids.

2 DEVICE FEATURES

Glow makes the linear experience of audio or video chatting come to life with its two unique features which claim to blend the physical and digital worlds together. This section lines up the unique features offered by the Glow experience, and potential uses of the device beyond it's advertised uses.

2.1 Upright tablet with physical restraint

The glow device combines the experience of connectedness with family by Facebook portal devices, but differentiates from that range of devices due to its child-friendly design and activities. Instead of communicating only via a screen, the glow device has two mediums of interaction for children including the 8-inch display where they can view the remote contact, and a 19-inch projected space for interactive activities which makes the experience richer than conventional video-conferencing (figure 2). While the games and curated content on the device is supposed to keep children engaged

while talking to a remote contact, it is designed to be used while seated. The Facebook portal device seems to have a slight edge in that regard, especially for scenarios where children want to move around the house to show stuff to grandparents, cousins or favorite uncle/aunt.

Fig. 2. Side-by-side comparison of a tablet device (iPad) and the Glow

2.2 Tangram Bits

Tangram Bits are the seven pieces of varying sizes included with the bundle, which can be used to complete a variety of puzzles (figure 1). Children may choose the puzzle they want to solve with the help of the remote loved ones while they assist and cheer them while they complete it. The puzzles are designed to provide a suitable challenge for young children, with a hint feature to assist them whenever they get stuck. At the end of the puzzle, the object comes to life making the experience delightful for the child. While I was amused with the various puzzle options available to utilize the Tangram bits, my 4 year old quickly became uninterested with it due to lack of physical appeal of the pieces, and the relative difficulty of the task as compared to simpler puzzles (also available within the games section). She was also annoyed by the lack of control on the touch-enabled mat as it kept slipping every now and then.

2.3 Scanning

Another amazing feature for the children (and for a parent like me) is scanning [1], which allows the child to convert their favorite toy or object into a digital image/sticker to be used within an art activity or for merely being amused by seeing the object turn incorporated into the activity. The newness and magicalness of the experience kept my 4 year old hooked with the Glow, and she kept bringing every possible toy to scan. The danger however arose when she started trying to put her hand and face below the projector in an attempt to convert them into a digital image. She also had some trouble waiting for the object to be scanned while her impatience got the best of her. After multiple attempts of leaving the object not having been scanned due to being grabbed midway, she learnt the optimal time and cues

[1] Fascinating process of Turning Queen Elsa into a digital image

of the scan activity being completed. I also noticed that there was no verbal feedback offered to the child during the activities, probably because they are assumed to be facilitated by a remote connection. But some voice cues indicating the completion of the scan activity would have been super helpful.

2.4 Connecting with a remote loved one

As stated in the Amazon Glow Terms of Use [1], the Amazon Glow service is restricted to be used within the United States (excluding its territories), which limits communication with contacts outside of United States, especially for immigrant families like ours. While we were initially excited to find a way to make our child interested in video calls with extended family members including grandparents, cousins and uncle/aunts residing outside of the US, we realized that we had to wait for some time for that to be possible. With that option out of the window, I tried reading to my 4 year old from a wide range of interactive storybooks while being in another room (figure 3). The virtual story book has a lot of fun interactive features such as flashlight mode which dims everything else except the portion being read, a rainbow trail around the line being read using a finger, and animated pages [2] in some of the stories. The Disney section has a lot of children's favorite stories with cool animation which attracts children more than the static versions of the book, but at one point I felt a built in option that reads the books aloud while the child turns the pages would have been much appreciated.

Fig. 3. Left: Remote connection displayed on the screen while the child can see the interactive storybook on the projection mat. Right: Child's space as seen by the remote contact

Some games (such as Tangram Bits puzzle) can be played by the child alone without being in a video call with someone, but there are others which need two players to function properly. My kid and I tried the two-player games while being in different rooms (figure 4), which turned out to be a unique experience of parent-child interaction through a connected device. My husband and I often try to ask questions about what she is watching on television to be have

[2] Animated storybook page: *Disney Moana*

an involved co-watching experience, and also play games together using Nintendo Switch, but I felt like we felt more connected this way even while being in different rooms.

Fig. 4. Word charade game where one person is the "actor" whereas the other is "guesser"

2.5 Beyond connection with remote loved ones

With an exception of when we had to play some multiplayer games, we used the Glow mostly as a free-standing entertainment device with some extra cool functions, which implied that it does not necessarily need to be used while being on a call with a remote connection. The privacy shutter , curated content and parent approved contacts all help create a safe virtual environment for the child, and I can also see it being used to engage a child through a remote caregiver [5] without compromising their privacy and worrying about threats of exploitation in case of a data breach. With children and parents being accustomed to virtual class sessions during the COVID-19 global pandemic, the Glow device can actually be used for remote learning, where children can participate in a one-on-one session with a tutor or an age mate. Finally, once the children are able to navigate through the various activities and media content offered through the Glow, they can give parents some much needed break where it can serve as an interactive engagement portal for them. Another possible use of the device can be to occasionally console a child while the parent is away before starting the night-time routine.

3 ROUNDUP

This section presents a summary of my perceived strengths and limitations of my experience of using Amazon Glow device with my four-year old.

3.1 Limitations

Presently, the device and application use are restricted to the United States, which certainly limits its primary advertised use (connecting with remote loved ones) for people with families across the globe. With no multiparty video support, you would want to stick with other popular video calling services such as Zoom or Whatsapp to connect with multiple

family members at a single time. The current release also does not support connecting to ad-hoc (or peer-to-peer) WiFi networks. Additionally, the form factor of the device makes it somewhat cumbersome to handle and store or put away.

There are also some limitations to the user experience which might be incorporated in the subsequent releases of the product. The device is currently developed to be used only in the home due to design restrictions of putting it on a flat surface and internet connectivity issues. It is also designed for stationary use, meaning the child can not move around while using it unlike other similar devices on the market, which offer immersive experience with a smart camera automatically panning and zooming as the user moves [10]. It is important to note that while the Amazon Glow claims to encourage connectivity with the tagline *"Be there for bedtime, anytime"*, American Academy of Pediatrics recommends against screen-based devices and internet access in the bedroom [7], rather avoiding exposure to screens at least an hour before bedtime. Even with the fact the parents have started being somewhat comfortable with previously frowned screen-time practices, it is practically unfeasible to prop the device against the bed or side-table, which is the basic requirement of use for the device.

3.2 Strengths

That said, the curated content courtesy of Amazon Kids subscription with no advertisements makes it a relatively safe virtual environment for young children. The fact that the glow device is not enabled by Alexa [8] or compatible with Echo Glow makes it more trustworthy for a parent who wants to avoid the recording and storage of their children's voice and video interactions on the cloud. The device features a large selection of activities which can be performed alone or a remote contact (child or adult), and the novelty factor of the device and interaction is bound to keep children hooked to the activities. It has multiple potential uses beyond connection with remote loved ones, such as remote learning and language assistance [4]. Amazon also offers a guarantee of 2-year worry free use including coverage for hardware breakage through replacement of the device.

3.3 Learning Curve

It is worthy of consideration if the experience would be so intuitive for the other half of the target users, that is the remote adults, who are assumed to facilitate the child with activities offered to enrich communication. As someone who could read English and is a somewhat adept user of screen-based technology, I was able to help my 4 year old navigate the various media choices as we played along and got accustomed with the Glow. There's definitely a steep learning curve for older adults such as children's grandparents who might not be as adept with it. After using the Glow for a few days, the 4 year old was able to show-off her newly acquired skills to educate her father about the various features the device had to offer. I am therefore optimistic that children will be able to teach the ways of this newer technology to their grandparents fairly quickly. A helpful update would be to include an option of enabling audio instructions and feedback during activities which is inherently expected to be done by the remote conversation partner, especially in cases where children want to use it as a stand alone entertainment device, or the remote contact cannot communicate with them due to a disability.

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