Leveling Up Together: Fostering Positive Growth and Safe Online Spaces for Teen Roblox Developers

Yubin Choi
joyda2525@gmail.com
KAIST
Daejeon, Republic of Korea

Jeanne Choi
jeannechoi@kaist.ac.kr
KAIST
Daejeon, Republic of Korea

Joseph Seering
seering@kaist.ac.kr
KAIST
Daejeon, Republic of Korea

ABSTRACT

Creating games together is both a playful and effective way to develop skills in computational thinking, collaboration, and more. However, game development can be challenging for younger developers who lack formal training. While teenage developers frequently turn to online communities for peer support, their experiences may vary. To better understand the benefits and challenges teens face within online developer communities, we conducted interviews with 18 teenagers who created games or elements in Roblox and received peer support from one or more online Roblox developer communities. Our findings show that developer communities provide teens with valuable resources for technical, social, and career growth. However, teenagers also struggle with inter-user conflicts and a lack of community structure, leading to difficulties in handling complex issues that may arise, such as financial scams. Based on these insights, we propose takeaways for creating positive and safe online spaces for teenage game creators.

CCS CONCEPTS

• **Human-centered computing** → **Collaborative and social computing**; **Empirical studies in HCI**.

KEYWORDS

Teenagers, youth, developing games, developer communities, online communities, safety, Roblox

ACM Reference Format:
Yubin Choi, Jeanne Choi, and Joseph Seering. 2025. Leveling Up Together: Fostering Positive Growth and Safe Online Spaces for Teen Roblox Developers. In *CHI Conference on Human Factors in Computing Systems (CHI '25), April 26-May 1, 2025, Yokohama, Japan.* ACM, New York, NY, USA, 18 pages. https://doi.org/10.1145/3706598.3713969

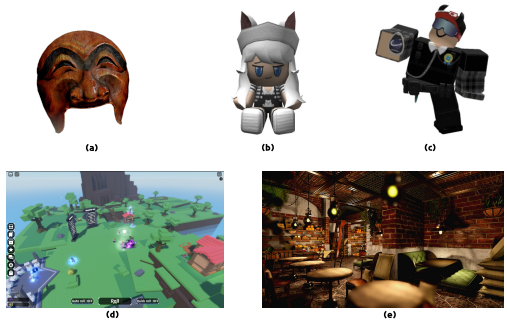

Figure 1: Games and elements made by study participants shared upon their permission. (a) and (b) are User Generated Content (UGC) that could be added to decorate personal avatars like (c). The images of (d) and (e) are game spaces.

1 INTRODUCTION

Game development offers teenagers an engaging and valuable opportunity to build technical skills, practice collaboration, and develop self-identity [12, 56]. Advances in programming support tools and school coding education have lowered the barrier for adolescents to start creating their own games. Yet, game development still remains a complex endeavor which requires a diverse set of skills, including design and programming skills as well as communication skills to engage with player feedback after deployment. Online developer communities have emerged as an important environment for supporting these young creators, providing spaces to share knowledge, overcome technical hurdles, and learn from peers [5, 61, 71]. These communities can break down geographic and hierarchical boundaries, fostering connections through shared expertise [29]. However, online developer communities are often created by and run for adult game developers, which may cause them to be less suitable for teen developers, potentially leading to risks of exposure to content and behaviors these young developers are not yet ready to handle. Prior research highlights how teenagers are acutely vulnerable to the potential harms they may face in navigating online communities ranging from bullying to harassment and exposure to extreme content [7, 26, 27, 38, 51, 63, 71].

To better understand this dual nature of online developer communities for teenager games creators—both their potential value and the risks they pose—we examined the case of Roblox developer communities. As a global game platform, Roblox hosts more than 40 million games[1] and holds a significant role in youth culture, with 58% of its 79.5 million daily active users under the age of 16.[2] Compared to previously studied environments such as the Minecraft modding ecosystem [24, 54, 60] and the Scratch programming learning-focused platform [5, 8, 55, 58], Roblox stands as a digital environment where teenagers have unparalleled autonomy to create, explore, and monetize their content with the following reasons. First, Roblox supports a diverse range of creators with

CHI '25, April 26-May 1, 2025, Yokohama, Japan

ACM ISBN 979-8-4007-1394-1/25/04
https://doi.org/10.1145/3706598.3713969

[1] https://backlinko.com/roblox-users
[2] https://create.roblox.com/creator

different levels of experience. Content on Roblox, from full-fledged games (known as "Experiences") to individual character assets like avatar clothing and accessories (known as "Creations") and game assets like background music, is predominantly user-generated. Therefore, we define "Roblox game developers" to broadly include not only game developers in the traditional sense but also designers, asset creators, and special effect artists. Second, Roblox supports developers through "Roblox Studio", a beginner-friendly platform for generating and publishing their user-generated content with Lua scripting, a programming language known for its simplicity. Third, Roblox's monetization model allows developers to turn their creativity into tangible rewards. Their in-platform currency, "Robux," can be converted into real-world money based on their specific policies.[3] Through this autonomy and accessibility, teen developers can engage in playful experimentation, gain independence, and build peer connections. This redefines the dynamics of user-generated content creation, providing a compelling case to examine both opportunities and challenges for teen developers.

To support its developers, Roblox maintains an official online community, the "DevForum," and official social media channels in platforms like Discord. However, individual developers have also established numerous unofficial, user-driven communities. These spaces cater to various developer needs, fostering peer-to-peer learning and collaboration. By studying Roblox's developer communities, we aim to understand both how online spaces can empower teenage creators and also how they can potentially expose them to risks. Our research was motivated by the unique context of Roblox developer communities, where teenage developers exercise significant agency and autonomy. Therefore, our research focuses on three core questions:

- **RQ1. Community Use:** Why do teen Roblox developers utilize online developer communities?
- **RQ2. Benefits:** What benefits do teen Roblox developers receive from participating in these communities and how do the benefits vary across different creators?
- **RQ3. Challenges:** What challenges do teen Roblox developers face within these communities and what strategies do they use to cope with these challenges?

We conducted semi-structured interviews with 18 teen Roblox developers to explore their experiences in their own words. Our findings reveal that these communities function as a dynamic digital playground where teen developers explore ideas, collaborate with peers, and may even find the beginnings of a career in game development by leveraging the monetization opportunities that Roblox provides. However, these communities also present considerable challenges. The interviewed teen developers reported encountering financial scams, inappropriate user interactions, difficulties balancing their online activities with their schooling, and being discouraged by the stigma surrounding the child-like image of Roblox. By examining these experiences, our study aims to provide insights into how online communities can better support teenaged developers, fostering a productive environment that maximizes their creative potential while proactively addressing the associated safety risks.

[3]Robux can be exchanged for 0.0013 USD per 1 Robux as of the time of writing, after certain thresholds have been met.

2 RELATED WORK

Our paper builds on three primary bodies of prior work. First, we explore research on game development with young users. Second, we discuss research on the social dynamics of online developer communities. Finally, we present prior work on risks and challenges for youth creators in online communities.

2.1 Youth Game Design and Development as Digital Play

Play is widely recognized as a crucial process for children's learning and development [59]. In today's digital age, the concept of play extends from physical to virtual environments like TikTok, YouTube, and various social media platforms [28]. Resonating with theories of intrinsic motivation and participatory culture [30], an increasing number of teenagers have become both consumers and producers–termed "prosumers" in digital spaces, participating by creating their own content in the form of blogs, gameplay streams, and game mods [26, 42]. While these "digital playgrounds" provide new avenues for engagement and learning for youth, they are mainly designed by adults to meet adult-centric goals and constraints. However, the digital autonomy of children and adolescents — the freedom to explore and express themselves in digital spaces— can be important, enabling children to gain independence, build peer relations, and form a self-identity [12, 56, 73]. Game development by the youth provides a unique opportunity to achieve this autonomy by creating and exploring their own games or virtual worlds, offering a type of playful experimentation not available on traditional adult-focused platforms.

Extensive research in HCI has shown that children and teenagers can benefit from learning to design and create games. Recent advances in technology [21, 44, 65], combined with the rise of computational education in schools [3, 53], and the development of child-friendly programming tools like ScratchJR, and Lego Mindstorms [19, 34], have lowered the barriers to game design. This democratization of game creation, driven by indie developers and modding [22, 23, 62] is complemented by studies showing children can also make games. Studies have demonstrated that involving children as co-designers in "serious" games helps them better grasp complex real-world issues [70]. Further, children learn computational concepts [11, 40, 41] through both "serious" [34, 64] and "non-serious" [69] game design. Collaborative game design has also been linked to improved communication skills and higher learning involvement of children [13, 25]. Broadly, giving teenagers autonomy in creating games leads to learning benefits across a variety of domains [8, 25]. We focus on Roblox, for its flexibility in game design options, kid-friendly programming language (Luau), and tools (Roblox Studio), making it a strong platform for teen-led game development. In this study, we explore the potential benefits that teen game designers & developers can gain from participating in the supportive social ecosystem of creating games.

2.2 Online Developer communities

Online developer communities built around platforms such as Github provide essential spaces for learning, collaboration, and social interaction. Development is rarely a straightforward process, and these communities often become hubs for mutual support.

Much research on adult-focused developer communities, such as GitHub and StackOverflow, has found that these communities provide valuable opportunities for knowledge sharing [61, 71], enhancing individual expertise [45], and collaborative coding to complete projects [72]. Similarly, indie game developer communities serve as *communities of practice*, where small, flexible team dynamics foster autonomy and creativity. In these settings, members often adapt their roles democratically, emphasizing collaboration and shared ownership [23].

While much of the prior work in this space focuses on *adult* developer communities, research on teen-focused developers, particularly in the context of Scratch, has uncovered a breadth of opportunities and challenges. Studies reveal the benefits of developer communities in learning computational skills and exchanging knowledge with peers [5]. Further, in Scratch team challenges, studies demonstrate that youth deploy sophisticated socialization skills: negotiating dynamic leadership styles for each project, building interpersonal trust, and cultivating common ground [2, 10, 17]. However, youth face distinct communication obstacles compared to adults. They often struggle to articulate their thoughts [8, 55] and adapt to the nuanced engagement expectations among different online communities [18]. Critically, peer recognition and feedback are pivotal motivations for community engagement—universally important, but especially crucial for teenaged developers [32]. Young creators, still developing their creative identities and networks, rely more intensely on peer recognition and feedback from engagement. These social interactions are fundamental to driving participation, building confidence, and fostering belonging within digital learning environments.

In contrast to previously studied Scratch communities, Roblox developer communities, while similarly youth-driven, operate within a distinct social and economic framework. Unlike Scratch, which prioritizes education and creativity, Roblox combines social engagement with broader agency in creations and a deeply embedded in-platform monetization ecosystem. Work by Zhang et al. has shown that Roblox teen developer communities engage in forms of collective ideation, discussing game design strategies and sharing feedback through external social media platforms such as Reddit [76]. Taken together, these findings underscore the importance of understanding online developer communities as dynamic environments that not only facilitate technical skill development but also nurture collaboration and social belonging for teen developers. While, previous research has primarily analyzed teen developers' public comments and forum interactions, our study directly engages teen developers. By conducting first-hand interviews, we uncover rich, nuanced insights into their lived experiences, motivations, and the challenges of participating within these youth-driven developer communities.

2.3 Child safety issues in online developer communities

Participation in online developer communities offers benefits, but it may also expose developers to a variety of challenges and risks. Research has consistently highlighted issues in online social spaces such as toxic comments, name-calling, and offensive language [9, 16, 46], as well as programming-specific risks like code theft [7] and malicious hacking in shared code [33]. Another layer of risks emerges in developer communities on social media platforms like Reddit and Discord, where many Roblox developer communities are based. These platforms bring the traditional threats that have been identified in studies of social media moderation, including discrimination [27] and personal attacks [51] to developers. For example, members of Reddit communities may experience repeated harassment across multiple subcommunities [38]. Children are particularly vulnerable in these environments due to the possibility of encountering more severe risks such as sexual abuse, cyber grooming, and exposure to explicit content [1, 20]. Exposure to explicit material within developer communities can lead to long-term detrimental effects on mental health [66]. Furthermore, prior work has suggested that adolescents may face emotional challenges stemming from addiction to or dependence on these platforms [75].

The Roblox ecosystem presents unique challenges due to its distinctive community structure. Unlike traditional platforms, Roblox blurs the boundaries between players and developers, creating a complex social dynamic where young creators often emerge directly from the player community. Kou et al. have pointed out that policies being unclear between creators and players as one of the reasons for harmful games including those featuring racist or misogynist content[35]. This fluid transition can inadvertently normalize problematic content, as creators may unconsciously draw inspiration from games that incorporate harmful themes or design elements. Also, the platform's proprietary development environment creates a form of technological "lock-in" that constrains monetization options only within Roblox. This can pressure teen developers to prioritize engagement and monetization over ethical design considerations. Moreover, what researchers term "aspirational labor" drives young creators to invest significant time and effort into content creation, often with minimal compensation [42]. The promise of potential future success motivates children to engage in unpaid creative work. Media critiques have pointed out Roblox's potentially exploitative practices of relying on young users to create content without proper compensation [48].

Though there has been much prior literature on online safety and aspirational labor, limited research has explored the overlapping dynamics of these phenomena in platforms like Roblox, where player and developer roles merge in communities where youth have significant agency. Our study addresses this gap by examining how youth perceived and experienced potential risks faced by teen developers, highlighting the major risks and proposing guidelines for potential interventions that balance opportunities and safeguards in youth-driven digital economies.

3 METHODS

Our goal for this paper was to understand the benefits and challenges teenager Roblox creators encountered in online communities. To this end, we interviewed participants who have joined at least one online developer community and have self-identified as "creators" in Roblox.

3.1 Participants

We recruited participants who met three primary criteria: 1) Teenagers between the ages of 13 - 19,[4] 2) "Creators" who have created two games or three game elements, per Roblox's definition of having created development tools (games, maps, models, or assets) or avatar items (User Generated Content, UGC), 3) being a member in at least one online developer community related to Roblox. We included participants aged 13–19 to capture a broad spectrum of experiences, as online behaviors and risks vary across different stages of adolescence [14]. To verify that participants were creators, we required them to share their creations with us during the interview.

To recruit such participants, we posted interview calls in popular Roblox online communities. We first joined online communities that showed up in a Google search for Roblox developer communities, including the Roblox official Developer Forum (DevForum), three Discord servers, and one Reddit subcommunity (r/robloxgamedev). Within those communities, we posted interview calls after getting permission from the moderators. We also recruited participants via snowball sampling, and we posted new calls in communities we learned about in early interviews. In total, calls were posted on the DevForum English and Korean Recruitment pages, nine Discord servers, one Reddit subcommunity, and one Naver Cafe — a social platform popular in Korea. Participants who were willing to be interviewed filled out a pre-survey that was designed to check whether participants matched our recruitment criteria. As a result, 21 participants were recruited. One participant dropped as she did not want to share what she made and two did not fit our criteria. In the end, we interviewed 18 participants. In Table 1, we show the demographics and information about our participants. The mean age of the participants was 16.3 years old (SD = 1.3) with a range of 14–19 years old. All participants were high school students except C15 who was enrolled in college at the time of the interview. Sixteen participants identified as male, and two participants identified as female. While there is no official census on the developer gender distribution of Roblox, statistics from StackOverflow developers show that female participants may be significantly underrepresented in developer communities. Of the 18 participants, 15 identified themselves as skilled in Scripting (programming) and 7 in 3D Modeling (multiple-choice possible). The average years of experience as a Roblox creator was 3.4 years (details in Table 1). 11 Koreans, 3 Americans, and one participant from each of Malaysia, Spain, Japan, and Denmark were recruited. While we had originally intended to report how long each participant had been in the developer community they had joined, we found that most participants had joined multiple communities (with one participant reporting having joined over 200) and could not recall the exact dates of joining. Therefore, instead, we report the platforms that each participant joined communities through.

3.2 Semi-structured Interview Method

We conducted semi-structured interviews to understand how teenager Roblox creators used online developer communities, the benefits they gained, and the challenges they faced. Interviews generally proceeded in four phases: 1) warm-up questions, 2) experiences as a creator, 3) developer community usage, benefits, and challenges, and 4) offline impact of Roblox developer experience. Example questions include *"Where did you go when you were stuck when creating previously mentioned creation?", "What would you miss if joined online community did not exist?" "Have you shown what you made to your parents?"*. The full interview protocol is shown in Appendix A.2. All interviews were conducted online via Discord Call or Zoom (without video) from the 3rd of July to August 15th, 2024 by the first author. The interviews were conducted in either English or Korean based on the interviewee's preference. The average length of the interview was 77 minutes. All participants received $20 (or equivalent in local currency) for participating in the interview.

3.3 Ethical considerations

This study was approved by the KAIST Institutional Review Board. However, as we involved teenage participants, we took additional precautions beyond those required by our institution. Participants were sent the interview questions in advance, and before the interview, we again explained the interview process thoroughly to ensure that they fully understood the interview contents and how the data would be collected for payment and analysis. Also, we emphasized that participants could skip a question or end the interview if they did not want to answer. Further, for payment, all participants received their parent or guardian's signature. After receiving the participants' consent, we proceeded with the interviews.

3.4 Analysis

We conducted inductive thematic coding [4] following the six steps of Braun's method on interview transcripts to understand the experiences of teens in Roblox developer communities and the benefits and challenges they perceived. The process started with uploading all audio recordings of the interview to Dovetail.[5] The transcriptions were automatically done in English or Korean based on the interview language by Dovetail. Then, the first and second authors each open-coded six interview transcripts independently while correcting inaccurate transcriptions along the way, identifying low-level themes focusing on how various online communities support teen developers of Roblox but also the challenges they face as a teenager. Next, the two authors discussed the themes to reduce the initial themes from 587 low-level concepts to 15 higher-level themes. The final themes were merged or split iteratively via Dovetail through rounds of discussion on overlapping themes or disagreements. Based on the refined themes, the two interviewers engaged in another iterative discussion regarding remaining inconsistencies, disagreements, and newly emerging themes, recoding two interviews (C5, C12) independently again to confirm agreement. Cohen's Kappa was calculated to determine inter-rater agreement, reaching a value of 0.78. After reaching agreement on the themes, the first author coded the remainder of the interviews. The final list of themes can be seen in Appendix A.1.

3.5 Limitations

Before presenting our results, we acknowledge several limitations of this paper. First, our participant sample does not fully represent

[4]Participants in South Korea were recruited up to age 19, as 19 is the age of majority in South Korea according to legal and cultural norms. Non-Korean participants were recruited up to age 18.

[5]https://dovetail.com/

Demographics	Options	Count (n=18)
Age	Number	*Mean* = 16.3 years *SD* = 1.3 years *Range* = 14-19 years
Gender	Male	16
	Female	2
Nationality	South Korea	11
	United States	3
	Malaysia	1
	Japan	1
	Spain	1
	Denmark	1
Profession *(multi-choice possible)*	Scripting	15
	3D Modelling	7
	Building	5
	GFX	2
	Animation	1
	Game Design	1
Roblox Creation Experience	Number	*Mean* = 3.4 years *SD* = 2 years *Range* = 4 months ~7 years
Participating Communities *(multi-choice possible)*	Discord	17
	DevForum	12
	Naver Cafe	4
	KakaoTalk	7
	Reddit	1

Table 1: Participant information overview. To anonymize participants, we present aggregate statistical data to describe them and refer to each person with an alias C1-C18. DevForum is managed by Roblox Corp. Other communities are managed by individuals or teams of volunteers.

the global population of teen Roblox developers. Though we do not know official statistics on teen Roblox developers, there is an absence of participants from South America, Africa, and other regions in our sample (See Table 1). Since different cultures have communities operating in their languages, our findings are constrained by the language capabilities of the research team. Moreover, even within the same language, each community has unique norms; for this study, we recruited primarily from larger communities with more than 10,000+ participants, which may limit the generalizability of our findings.

Further, because our recruitment calls included criteria that required participants to have made at least two creations, our participants are likely skewed toward those who are more active community members. As seen in Table 1, the majority of the participants in this study had spent more than two years creating content for Roblox, so true newcomers who had just begun creating are underrepresented in our sample.

4 RESULTS

In this section, we summarize why teen developers joined online communities and which ones they joined. We report the benefits they found and the challenges they faced during their community experiences. For each challenge, we discuss participants' coping strategies.

4.1 How do teen Roblox developers utilize online developer communities? (RQ1)

This section first introduces the motivations that drive teen Roblox developers to participate in developer communities. Next, we show how teen developers use the communities to meet multifaceted technical, social, and career needs, depending on the distinct characteristics of each community.

Participants joined communities to get help or for social support. For teen Roblox developers, the journey into online communities often started with a spark of technical necessity and social curiosity. For example, C12 started with a simple search: "Roblox scripting help." Stuck on a bug that refused to cooperate, they found themselves on DevForum, which appeared in the top 3 results in a Google search. Others, like C7, found their way into communities through a friend or searching popular social media platforms to find somebody to talk to about Roblox development. Per C2, *"my school friend sent me an invite to this scripting server. At first, it was just for fun, but then I realized I could ask questions there too. It wasn't just work—it felt like hanging out."* Korean participants like C16 also mentioned searching open chat rooms in KaKaoTalk or Naver Cafe, which are both frequently used social media platforms in Korea, for a friend to talk about Roblox development.

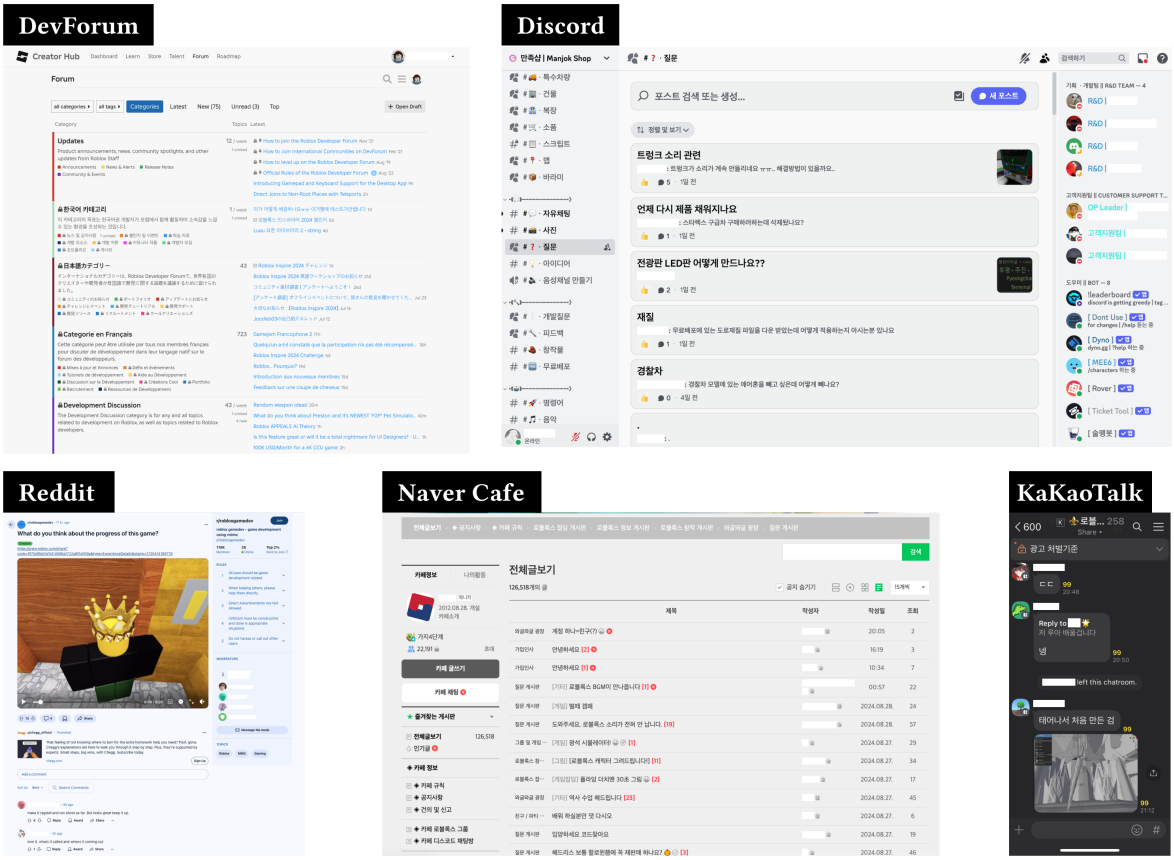

Figure 2: Different online developer communities

Different online platforms offered unique interaction styles and community characteristics. Commonly mentioned platforms were DevForum (Roblox official community), Discord, Reddit, and Korea-specific platforms like Naver Cafe and KaKaoTalk, as depicted in Fig. 2. These communities revealed dramatically different characteristics that profoundly shaped user experiences based on community ownership, modality, and culture. For example, DevForum is a structured, text-based platform for learning, question-asking, and solution searching. Moderated by Roblox, it had more limitations on what could be shared due to safety precautions. In contrast, social-media-based developer communities such as Discord presented a more dynamic environment with more functions.

> *[Roblox-related Discord servers] are friendly, more energetic, and a little bit more chaotic but have more freedom, and flexibility and don't have as stiff an atmosphere as DevForum. (C17)*

This was possible because Discord supported more interactivity between users through features such as voice chats and screen shares. Most importantly, anyone could create their own community servers and decide the rules. Participants mention sharing funny memes as a joke, playing games together in independent voice chats with community friends, or showing their live coding progress to community members like a "code with me (C9)" in peer-led communities. To many participants, Discord communities were preferred for the "real-time communication (C10)", and the ability to start your own community easily.

Participants strategically navigated multiple communities to meet diverse personal and professional needs. As teen developers explored and adapted to different communities, they began strategically using these digital landscapes. As C13 explained, their approach shifted from widespread engagement to more purposeful targeted participation:

> *Twitter is where Roblox employees can easily discover developers by looking at their work, while Naver cafes are preferred by professional companies. Twitter allows light self-promotion and easy visibility. Discord enables real-time work sharing. As I developed deeper relationships in Discord developer communities, I realized uploading my creations to every community was inefficient, so now I focus on Discord communities only. (C13)*

Korean teen developers like C13 used common social platforms in Korea including Naver Cafes and KaKaoTalk Groups, which also served as a first step into other global developer communities. C14 first learned about Discord after talking with members of KaKaoTalk

Groups and Naver Cafes and got to know other servers after being familiar with Discord. However, for most participants, including C13 and C14, DevForum and Discord were reported to be by far the most frequently used, so our analysis focuses primarily on these two platforms.

These platforms illustrated how seemingly similar activities could manifest entirely differently across digital spaces. For instance, the simple act of sharing game creations took on distinct characteristics depending on the platform. On DevForum, sharing meant formal presentations with detailed technical explanations and structured feedback. In contrast, Discord communities transformed the same activity into a casual, real-time interaction—developers might quickly screen share their work, get immediate reactions, and engage in spontaneous collaborative discussions. The varying usage is depicted in Fig. 3.

Teen developers visited DevForum for formal questions and to access comprehensive game development resources (e.g., the Q&A database). In contrast, participants used Discord as a decentralized ecosystem where teen developers could create their own communities. C11, for instance, explained this diversity of communities, noting *"I used one for scripting help, another for finding jobs."* C18's approach exemplified this strategic community usage, participating in over 200 Discord servers to gather a diversity of inspirations: *"I get ideas from community discussions across platforms. I noticed kids learning grammar, so I created a game that improves English skills by using GPT to generate random word explanations."* Some participants created their own Discord communities to connect with their games' players (C7), their YouTube followers (C16), or their UGC buyers to get feedback on their new 3D models (C4). C4 mentioned how he realized his UGC was not as popular as he thought it would be in the market, compared to the efforts he made. He initially decided to hear from other developers who were his customers on what features to add, which led him to make his own Discord community with developers which eventually reached a size of 2700 members at the time of the interview.

This diversity of approaches shows how teen developers don't just use communities—they strategically construct digital ecosystems that support their learning, creativity, and professional growth by understanding and leveraging the unique social dynamics of each platform.

4.2 Benefits from participating in developer communities (RQ2)

This section outlines the benefits reported by interviewees from their participation in online developer communities. Participants enthusiastically reported the benefits that each of their communities could support.

4.2.1 ***Learning and improving technical skills.*** When participants first joined developer communities, they often joined for the purpose of asking very specific questions such as *"Why does my structure keep collapsing? How do I fix this phrase error?"* Our interviews resoundingly confirmed that learning technical skills to create a game or design game elements was the most prevalent benefit, being the initial motivator for participating in the communities in the first place. Such learning typically emerged from searching for related questions that had previously been answered

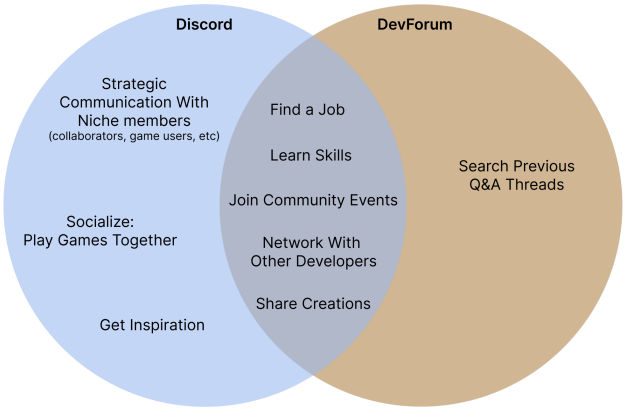

Figure 3: Comparison of online developer communities. We only visualize the most commonly used with at least one differing usage.

or asking new questions to the Q&A channel within the community. C4 shared that in the beginning, he asked a lot of questions to learn how to use the Roblox Studio UI and learn answers that didn't show up when searched.

Experienced Roblox developers, with over five years in their profession, continued to seek advice from community members to resolve complex issues in development. C10 mentioned one of his communities having "truly skilled" developers well beyond the level of hobbyists, whose advice was like a guaranteed map to resolve whatever problems community members were having. Even participants who were usually passive observers gained valuable insights, such as improved 3D modeling techniques or new mathematical concepts for animation by looking at the active community-level Q&A channels.

> *I have learned a lot of stuff. I [wouldn]'t be good like this to make my own games. If DevForum didn't exist, then I couldn't solve problems that I struggled [with]... that forum is really important.* (C18)

Many of our participants also described learning from collaborative team projects they joined within the community. Participants would find opportunities to join a group for game development in the channels dedicated to hiring collaborators (section 4.1). Working in small groups was another big part of the learning process as participants often discovered their preferred roles (e.g., game design, scripting) while trying out different team dynamics. Collaborating with more experienced developers facilitated skill development, as experienced team developers would give advice and tips on game development including file organization or shortcuts. Participants like C12 mentioned how team collaborations would also build relationships making it easier to ask questions in a 1:1 manner instead of publicly asking within the whole community.

> *My collaborators, friends actually, are really amazing. They even helped me build a map once. I ask them a lot of questions when I'm stuck, too much to post in the official Q&A. And sometimes I did help them too once - very proud of that. (C12)*

Additionally, shared community resources supported participants' self-directed learning. C6 acknowledged how using free 3D assets helped him transition from beginner-level creations to complex, customized designs. Sophisticated 3D models, music, codes, Roblox Studio updates, and AI tips were shared within the communities - some having separate channels for sharing. These helped participants to stay updated, quickly build games, and later explore how other community members structured their code or composed 3D models:

> *I feel around 40% of the stuff I learned was from the communities. The resources really help you because it's daunting to build everything at first.. People just share [the resources] kindly. (C6)*

Participants like C9 mentioned how community feedback channels further motivated participants to continue their effort to overcome challenges. Consistent with Roque et al. arguing that collaborative learning happens in online communities [55], we find that developer communities fostered learning as a community in practice. Further, learning for participants was a fun and self-motivated activity supported by their participation in developer communities.

4.2.2 ***Developing social skills by building networks and relationships.*** Developer communities weren't only focused on building games. Often they also dedicated space for building networks and relationships with other members. As the communities fostered interaction between users to discuss and collaborate, participants could develop soft skills through this online communication. For many participants, the space felt like an extension of their social lives or even their full social life – in the case of a participant who was home-schooled – particularly because Roblox communities were unique. Unlike other developer communities, Roblox's collaborative and "peer-led" environment, especially on Discord, is characterized by members of similar ages and informal interactions. Participants mentioned they could guess community members were young by the jokes they shared and by how the time people showed up seemed to be after school. This sense of camaraderie and shared interests fostered a unique ecosystem where participants felt at ease discussing development, collaborating on projects, and communicating in a more casual and fun-driven way. C7 described his communities as a space where people like him could breathe:.

> *I really enjoy that kids my age can talk about (game) development stuff. In places like Unity or elsewhere, most of the people are older, busy working, there's not really room for saying "Hey, I want to make a fun game like this, let's do it together". The conversations are more serious, about profits rather than fun. The atmosphere is entirely different. (C7)*

But working with others online was not always easy. Self-motivated collaborations with group members sometimes encountered challenges when team members had different goals for development (e.g., for fun, for the money), and as such they required tact, patience, and openness. Participants learned to navigate interactions with diverse cultures like C9 who mentioned having worked with friends on three continents. This expansion beyond their local network meant they had to adapt to communicating online. Participants mentioned the communication strategies they have learned through the process of collaboration – starting conversations kindly, being clear about intentions, and finding common ground.

> *I now add labels to my 3D models so the scriptors understand what I mean. That really helped us sync (C2).*

As their confidence and self-efficacy grew, participants began taking proactive roles within communities. Participants like C12 mentioned they gained self-assurance in promoting their skills in the community. Some participants also mentioned taking leadership roles within projects as they gained more confidence in how to manage talking within the community. Four participants (C2, C4, C6, C9 took moderation roles in Discord developer communities where they once joined as newcomers. Some participants forged friendships and developed social capital, improving their reputation within the broader community. Some participants (C3, C7) who did a few projects together discovered they lived close to each other and managed to meet and become offline friends. For instance, participants reported that these casual local meetups provided more personalized interactions, which proved to be important for building long-term relationships. This confidence from community involvement led them to explore new roles, such as creating Discord communities or expanding their activities on platforms like YouTube.[6] Three participants (C1, C4, C17) built their own Discord developer communities to engage with players of their game, collaborate with employees of Roblox, with C6 seeking to establish the largest Roblox developer community in Korea. These findings show how Wenger's concept of Communities of Practice succeeded naturally in teen developer communities, where participants gradually took different roles and identities in the community [39]. Most participants mentioned recognizing the importance of community mentoring and were willing to pay back the help they got from the community.

> *At first, I was just an observer. Now, I'm leading a game I thought of and having a voice in the community. It's amazing to be recognized for my skills and be helpful to others. (C14)*

Within a community built on shared ambitions and playful collaborations, participants could feel heard and, through this connection, experience a sense of belonging.

4.2.3 ***Turning Hobbies into Careers.*** For some participants, Roblox development was a hobby. For others, it became something far bigger. Monetization opportunities, such as commissions from collaborations and revenue from creations, served as a strong motivator to continue development for those who consider Roblox development beyond a hobby. 13 participants pursued commissions from community hiring posts, creating a vibrant marketplace for part-time work. As such, C13 sought in-community jobs for income, which was particularly beneficial in countries like Malaysia with favorable exchange rates for dollars earned, while C17 earned money from selling his UGCs (avatar items), keeping him motivated. Community events with prize rewards further enhanced these financial incentives. Four participants had made revenue from their developed games, and two participants had worked together on the same very successful game, which had temporarily been among the top

[6]https://www.youtube.com/watch?v=lnhrFUmFpak. C6 mentioned creating his YouTube channel to share his mini-games with a broader audience.

10 most played games on Roblox. While one teen developer made a game from his own idea, another participant (C4) mentioned he was invited to the team, and suddenly the game "blew up". This kind of success of turning developers' games into huge money was often a common story that participants were aware of and strove for themselves, working in a form of aspirational labor as described above. While "fun" was the main motivation for creating Roblox games, monetization provided an overall substantial additional boost for nearly all participants.

> *I get paid a lot by Roblox simply because people like to play my team's game. After members saw my work, I was invited to join the team community. And when you get paid, that kind of just makes you more intrigued and keeps me developing. Also, I learned economics that way. (C3)*

As participants grew more skilled, creating different projects (see Fig. 1), recognition within their communities followed. Some participants, such as C16, were recognized as official Roblox ambassadors, and such participants had chances to go to local Roblox conferences, meet senior developers, and develop strong social capital. C16 mentioned having TikTok and YouTube followers help gain him recognition, though he thought his game development skills still need improvement. From these experiences, C16 dreamed bigger: going to the world Roblox conference and pitching his game. Skill enhancement led four participants (C1, C2, C6, C10)) to secure freelance work under a formal contract with a small third-party company and to secure longer-term employment in a few cases(C13)). Despite lower initial offers given due to their age, their proven skills eventually led to better opportunities and, for some, serious consideration of a career in Roblox development such as a game developer or 3d modeling designer. Some saw their hobby as a potential career path and pursued related opportunities in the form of a full-time job or related majors in school. For example, C5 planned to go to a game-development-oriented high school. Similarly, C7 mentioned her career growth:

> *Actually, at the company I'm with now, I'm making my own game. I joined this company because they made me a good offer in DM, saying I could continue my side project and still receive a regular salary. The only thing is, I have to give a portion of the earnings to them. (C7)*

While some participants didn't view Roblox development as a long-term path—three mentioned shifting focus toward school or other pursuits—15 participants valued the foundational skills they acquired, such as understanding 'if' statements and loops, and felt confident applying these abilities in other fields. Contrary to prior research suggesting that Roblox creates a lock-in ecology for developers [36], seven participants had positive experiences, discovering a passion for problem-solving or design, and expressed a desire to continue developing their skills beyond Roblox. This includes learning advanced modeling software like Blender and exploring other programming languages such as JavaScript (C15).

> *I'm pretty confident with Blender[7] now. I've noticed people using UnReal in Unity games at my current company. I'll probably try it or 3DMax (C2).*

4.3 Challenges from participating developer communities and associated coping strategies (RQ3)

In this section, we report the various challenges participants experienced in developer communities related to community accessibility, sustainability, and inter-user challenges between members.

4.3.1 ***Struggling to find the right community.*** Although online communities offered significant benefits for growth, many participants faced difficulties discovering and joining the right ones. Discord, widely used for its flexibility in creating community channels and having diverse modes of communication, was the preferred platform for most developer communities. However, its invitation-only model often created barriers for newcomers. For instance, beginners like C8 were unaware of these communities until being introduced to them during our interview, revealing the challenges participants face in accessing some online spaces. According to moderator participants, restricted access was necessary to ensure safety, protecting community members from potentially-problematic users.

Once participants joined a community, integration into the community posed another challenge. While this process was vital for their continued involvement in the community [23], navigating Roblox-specific terminology and community dynamics felt overwhelming, especially for young participants joining their first online communities. The diversity of communities meant that experiences varied widely, with some being welcoming and others less so. C16, for example, described feeling isolated when his questions were ignored or met with unhelpful judgmental responses without explanation, which left him discouraged and questioning his place in the community.

> *I reached out to one of my collaborators once. They solved it [my problem] but didn't explain it to me. Instead, they said my code was really messy which it isn't (C12).*

To get used to the community, participants mentioned various strategies such as trying to spend more time, observing others, making friends through collaboration projects, or playing games together with community members. Advanced teen developers faced challenges in finding the right communities that matched their skills and offered meaningful growth and networking opportunities. Sometimes, the communities they belonged to felt too small for them or did not have enough resources for them to grow. Language barriers also created obstacles. While many prominent developer communities were English-speaking, non-native speakers from Korea, Japan, and Spain, often felt more comfortable in communities that used their native language. However, such communities were harder to find. For instance, when C4 wanted to access more advanced developer resources, he found no materials available in Korean and had to resort to translating English resources.

[7] 3D modeling software not made by Roblox but often used among Roblox developers for more complicated modeling

> *I have worked with a lot of different people - American, UK, Brazil, and other EUs. Personally, I like Spanish people the best as a Spanish creator. But, from what I know, there aren't Spanish Roblox Creator communities out there. (C14).*

4.3.2 ***Struggling to Balance Commitments.*** Balancing Roblox development with academic commitments emerged as a major challenge for teen developers. Participants who had used the community for a long time, such as C14, reported that many peers became inactive as they advanced in school, disrupting community dynamics and slowing down the progress of collaborative projects. This was especially challenging when a knowledgeable mentor had to leave the community. C15, who enjoyed helping out and answering questions in his communities, felt it becoming harder and harder as he was doing it voluntarily and faced more and more serious school works as an 11th-grade student, but he was concerned about the impact his absence might have.

> *Well, there are three large times when people disappear – starting middle school, high school, and college admission. Some do come back, but others don't, especially if they decide to focus on studying. (C7)*

Participants who continued in Roblox development often aimed to pursue it as their career, sometimes at the expense of their education. For instance, one participant (C13) became so overwhelmed and very sleep-deprived with balancing her Roblox projects and school work that she took a semester off from school to concentrate on her Roblox job creating new 3D maps and UGCs. Others viewed Roblox as a hobby, balancing it with their education, like C18, who chose to leave Roblox entirely to focus on his college plans.

Social perception of Roblox as "childish" also further complicated the sustainability of the communities. As teenagers, participants were conscious of how their involvement was perceived negatively by parents, teachers, and peers outside of Roblox, which sometimes undermined their motivation. Participants like C7 mentioned facing opposition from his parents, school friends, and teachers because Roblox development was perceived as *immature* to pursue as a high school student.

Many participants, aware of these perceptions, initially concealed their activities in Roblox development. For example, C13 described hiding her activities until she achieved significant milestones, which felt important enough to gain validation from external people.

> *Oh wow. It felt like living a double life - a secret small hobby ... until I reached a certain level of quality in creating what I imagined. Now, my parents show my work to relatives. They usually say it's fascinating or impressive. (C13)*

Some participants eventually won their parents' support by demonstrating the financial potential of their development. Monetization often emerged as a validation–proof that their work mattered. Like prior work on TikTok teen creators [6], making money convinced their parents to believe in their activities. As in the case of C6, winning a Roblox competition or earning game income helped skeptics see Roblox development as a legitimate career path. This monetization, however, brought its own set of challenges, which will be detailed in more depth in the Discussion 5.2.

> *At first, my parents were against it, but I did it anyway. They said like, " you're spending too much time on something unproductive." But once I won some Roblox challenges prize and received strong revenue, it helped them see Roblox's potential for a serious career. (C6)*

In rare cases, participants attended schools that supported game development, integrating Roblox development into their education. These students benefited from taking courses on programming or 3D design, which they applied to their creations. Some schools actively promoted Roblox development, with C16 describing how it was encouraged by his science teacher and even featured in school-wide events organized by the student council. Participants like C4 had the resources to consult with school teachers for advice, including valuable input from specialized faculty such as architecture teachers who provided guidance on creating immersive spaces. This created a synergy between their schoolwork and development efforts. For instance, C7 chose Roblox as a career path after exploring other platforms in school. Beyond formal education, some participants found support through private instruction or family connections - C12's parents invested in private Roblox coding lessons, while C17 received guidance from family members who worked as programmers.

> *I go to a school that specializes in game development. They mainly teach tools like Unity or Unreal Engine, and we release game on Steam or Google Play. Roblox, however, felt much friendlier and better for monetization. So, I looked into it more seriously. (C7)*

Despite these positive examples with offline resources, participants were discouraged by negative perceptions saying that there were not many resources available outside online developer communities for a longer term career, which led many participants away from game development, impacting the sustainability of their communities as members came and left.

In response to the challenges of community engagement, many beginner developers turned to AI tools, mostly ChatGPT, for support. Participants found AI to be convenient and effective for basic coding tasks, idea generation, and design feedback without feeling like they were burdening community members. However, most agreed that AI alone could not replace the depth of knowledge and collaboration found in communities. Complex issues still required human insight and collective problem-solving.

4.3.3 ***Dealing with financial scams.*** Participants claimed both financial scams and inter-user conflicts as significant challenges within developer communities. Consistent with findings on harmful game design in previous research [35], financial scams were a recurring issue. Participants either personally experienced being scammed or knew others who had fallen victim. Scams often included developers being underpaid or not paid at all, even for successful projects. In some cases, participants paid in advance for work that was never completed. C18 reflected on how the frequent collaborations that happen in the communities made reputation and trust crucial for successful projects. This trust-dependent nature of collaborations often left new members vulnerable to exploitation:

> *You should like be aware of people because sometimes some young developers trust other developers too much and get scammed. (C18)*

While scams were less common in developer-focused communities than in Roblox player communities trading UGCs, participants still viewed them as prevalent in certain developer communities among members especially those who want to make profits. Moderator participants explained that scammers often exploited community norms of mutual trust and conducted fraudulent activities in private chats, beyond the reach of moderators, and also bypassed bans by creating new accounts. Six participants explained how this left the scams to be addressed by the young community members themselves. Even in cases of blatant plagiarism or impersonation, responses varied widely. For example, one participant (C18) mentioned that he felt that it was acceptable for others to copy his game, as he felt that it would eventually lead to more growth of his game through the popularity of similar games. Other participants took creative or legal steps to protect their work. For example, C5 mentioned trying to resolve this by learning about intellectual property law and norms, which was not covered by her school education, and as a result she developed better watermarking that could not be deleted easily. Another participant (C9) said he sabotaged a collaborator by inserting infinite loops into the code to address non-payment.

However, dealing with plagiarism and financial disputes often felt overwhelming, especially for younger participants. Most collaborations proceeded in an informal way between community members without any written contracts. Except for the few participants employed by companies and working under a formal, legal contract, the legal aspects were described as a confusing and unfamiliar concept, leaving both the participants and their legal guardian(s) unaware of how to navigate such matters. C2, for example, described feeling powerless in a case where their development team earned only a fraction of the revenue generated by their game:

> *Our developer team received about 2,000 Robux a month[8]—when we know the game is making 200,000 to 500,000 Robux monthly. We didn't report it because it was hard to find the legal documents. Also, within Roblox, there is an implicit atmosphere of just trusting each other. The private matters usually stay between the individuals and not the whole community. So, as I developed a lot of games, I experienced not being paid, or someone using hacks on my game, copying it, and putting it in their own game. (C2)*

Such experiences led many participants to be more cautious about collaborations, while some became demotivated toward creating games together. Despite the community's collaborative spirit, the lack of formal protections left many young developers vulnerable.

4.3.4 Dealing with Inappropriate Users. Although Roblox creator communities were widely perceived by participants as safer and more respectful than Roblox player communities, instances of inappropriate behavior were not entirely absent. Trolling, disputes over critical feedback, and unauthorized self-promotion emerged as recurring challenges that participants consistently confronted. More alarming incidents included egregious violations such as banned users disseminating explicit AI-generated content. Female participants mentioned seeing uncomfortable chats that made them choose not to use their voice-chats and to use masculine-looking avatars to conceal their gender. In line with prior work [36] some participants experienced situations where other developers promoted games embedded with radical nationalist ideologies. While they were banned from their community, the problematic users made new accounts again and continued to create these games.

The likelihood of encountering such incidents often depended more on how a community was managed than its size. Participants claimed to prefer larger developer servers, as they had dedicated moderation teams and clear rules, typically providing safer spaces. In contrast, smaller, close-knit communities, built on presumed mutual understanding and personal connections, sometimes inadvertently created environments where problematic behaviors were systematically overlooked. This inconsistency shows how effective moderation practices played a more decisive role in shaping the community atmosphere than member count. This led to C10, a community manager, having an invitation-only approach to maintain a respectful environment.

> *I manage communities where all the members are verified [with a size of 300 users]. In our server, we try to maintain a clean environment with good developers. There's a lot of constructive conversation between the admins and the users. But sometimes people from the shady side also join, so we have to deal with them occasionally. Because of these issues, we don't promote our community. (C10)*

The occasional presence of inappropriate users underscored the ongoing challenge of cultivating trust and professionalism in Roblox developer communities. These incidents reminded the participants of the delicate balance required to sustain a positive and inclusive environment for collaboration.

5 DISCUSSION

Our findings have identified that participation in Roblox developer communities fostered individual growth among teen developers, particularly in building technical skills and social communication skills. These benefits align with prior work on indie game developers, where collaborative environments encourage democratic leadership and shared ownership of projects [22]. However, these social and technical benefits coexist with challenges such as financial scams and interpersonal conflicts. This duality emphasizes the need to take a more comprehensive view: what makes a positive, safe online community for teen game developers? In this section, we address this question by highlighting key components of growth-fostering online communities, complexities introduced by monetization, and implications for fostering safe environments for teen developers.

5.1 Key components for fostering growth in online developer communities

In this section, we identify three critical factors driving many of the benefits participants reported from online Roblox developer

[8]Approximately US $25 at the time of writing.

communities: play as a core motivation, opportunities for meaningful communication, and access to growth-enabling resources. Some of these factors were strongly aligned with previous work but manifested in new forms in the in-the-wild, play-driven case of Roblox developer communities.

5.1.1 ***Self-driven play as a Core motivation.*** Teen developers were self-motivated by the intrinsic enjoyment of creating and experimenting within the Roblox ecosystem, reporting fun as their primary factor for why they develop games. This demonstrates how playfulness remains a cornerstone of sustained community engagement and growth in teen-created and moderated spaces. Similar findings in developer communities like Scratch show technical development gained through collaborative learning in communities [5, 8, 55] or adult-focused platforms like StackOverflow [61, 71]. However, unlike Scratch, where play occurs within structured learning environments, Roblox supports a hybrid model where teens independently create and moderate their spaces. This dynamic fosters a unique sense of autonomy and ownership, consistent with theories of participatory culture [30, 31].

Freeman highlights the critical role of small teams and "democratic" participation, wherein collaboration fosters shared decision-making and individualized contributions [23]. Similarly, teen-led Roblox communities function as small, dynamic ecosystems where developers work collectively to design and iterate on games. Despite being self-organized, these communities mirror the socio-technological challenges faced by indie developers, especially in identifying the right collaborators with shared goals. For teens, these challenges manifest in managing their team formation and navigating technical systems with limited professional guidance. Building on Freeman's insights, we argue that the playful roots of the participatory culture within Roblox developer communities are crucial for encouraging long-term participation and growth. Even as challenges arise, such as encountering scams or interpersonal conflicts, the ability to experiment freely within the collaborative and friendly atmosphere of Roblox developer communities enables resilience and creative exploration.

5.1.2 ***Access to rich technical and social resources facilitates learning.*** Our findings underscore that access to both technical and social resources plays a crucial role in fostering growth within developer communities. For newcomers and even more experienced participants, the ability to connect with others is vital for learning, collaboration, and expanding their professional network. However, communication barriers often hinder this process. Without an environment conducive to meaningful interaction, some participants, especially beginners, turned to AI tools like GPT for technical support, particularly for coding tasks and idea generation. The increasing support-seeking from AI mirrors how indie developers use AI as their programming partner in idea generation [49]. However, while these AI tools provided immediate assistance, they did not offer the depth of collaboration and mentorship that could be found in community-based interactions.

Furthermore, we noticed resource differences beyond communities. Some participants felt that their communities had abundant resources to learn and had members who were active in answering questions, while other participants wanted to search for more advanced communities. This discrepancy suggests the importance of ensuring that all members, particularly beginners, have equitable access to the necessary tools, guidance, and networking opportunities that foster their personal and professional growth within the community.

5.1.3 ***Incentives can drive community growth.*** Lastly, providing incentives like monetization proved effective in fostering growth within communities, as seen when participants joined in response to commission posts and developed their skills accordingly. Community-wide competitions with Robux prizes were also incentives for participation commonly enjoyed by participants. However, these forms of engagement were voluntary, relying on the social value of the community to motivate participants like in other developer communities [43]. This made it challenging for advanced developers to participate, as they often struggled to balance community involvement with schoolwork and development loads. Thus, implementing formal, financial incentives and/or less formal, social incentives each can enhance growth in different ways for different populations.

5.2 The complexities of a monetized hobby ecosystem

Monetization motivating teen Roblox developers is not a new concept; it fits within the broader framework of **aspirational labor**, where teen content creators are motivated by the hope of future success [15]. This phenomenon is well-established in scholarly literature, which discusses the developmental role of unpaid creative work and the intersection of passion, skill-building, and economic opportunity in youth participation built upon venture labor and hope labor models [37, 47]. Roblox stands out from other content creation platforms, such as YouTube, blogging, and game streaming, because it combines game development with monetization—offering teens the opportunity to engage in both creativity and entrepreneurship; Unlike YouTube influencers or TikTok creators, whose success is often based on personal branding, game developers must create engaging, playable content, requiring specific technical and design skills [42]. Compared to many traditional game modding processes, Roblox Studio significantly lowers technical barriers, making it more accessible and empowering to teen developers.

The appeal of Roblox's monetization system is clear, as it enables teenage developers to make money from their passion. Many participants in our study reported that the platform offers them increased autonomy compared to other teen job options, such as part-time work, as it allows them to earn money independently with what is at its core a form of play, without direct parental oversight. Teen developers value the creative freedom Roblox provides, viewing it as a space to experiment, hone their skills, and build a reputation with the potential for success. Drawing on previous work by Postigo [52] and Taylor [68], this mirrors the "modding" culture in the video game industry, but with more accessibility, diversity in making profits from game, game items, game assets, and technical skillsets. Some participants strategically leveraged their games to build social capital and professional networks, demonstrating the potential for both skill development and future monetary success.

However, the formal blurring of play and work through Roblox's monetization system creates new challenges. While the prospect of financial independence is a strong motivator, the absence of formalized structures or clear guidelines on what constitutes "labor" leaves teen developers vulnerable. Participants described incidents of scams and exploitation within peer communities, highlighting their lack of protection and limited knowledge about navigating such risks. For teens in countries requiring parental consent for legal work, the situation was further complicated. Some participants who joined small companies faced significant hurdles due to their families' unfamiliarity with the complexities of game development agreements. Many parents, unfamiliar with such arrangements—especially in the niche context of Roblox—struggled to judge the fairness or legality of contracts. This inexperience often led participants to accept vague terms, resulting in unclear expectations and under-compensated work. Two participants shared instances where what began as creative exploration turned into unpaid or underpaid obligations, consuming more time and energy than they had anticipated.

The monetization ecosystem itself can exacerbate these challenges, sometimes driving teens to prioritize profit over ethics. This pressure can lead to decisions that compromise the well-being of younger players, such as designing games with harmful elements to maximize profitability. Furthermore, the financial burden associated with advertising and publishing UGC—such as the cost of publishing limited UGCs, which can reach 20,000 Robux (approximately 15 USD) per item—adds another layer of strain, as previously noted by Kou [35].

Living in a digital landscape driven by entrepreneurial ideals, it is natural for teens to be drawn to the prospect of creating their own games and earning financial rewards. However, we noticed that among the participants, there was an almost unwavering belief that hard work could secure success—a sentiment that reflects meritocratic ideals. This firm belief can quietly erode well-being when the realities of inequality go unacknowledged [74]. Participants like C13 described his failure in market success solely primarily as personal shortcomings, pledging to work harder to overcome them. This type of belief system can turn a creative playground into a space of self-doubt and relentless striving [57].

Our findings also highlighted the disparities in access to resources that shape these success narratives. For example, one participant, C12, thrived with the support of parents who invested in his coding education and helped him navigate complex programming concepts, while others struggled due to a lack of support from their communities. While our interviews cannot definitively determine how much these external resources contributed to success in game development, they underscore the importance of recognizing the roles that factors like mentorship, financial backing, and even sheer luck play in shaping outcomes.

Therefore, to foster a healthier perspective on monetization and success, it is critical to help teens see the broader context of their aspirations. Sharing details of success narratives including finding the right team, the right endeavor, and the right collaborative support will lead teen developers to focus more broadly than on just profits. In this way, a more balanced approach to ambition can be cultivated without compromising the well-being of developers–one that empowers teens to pursue their goals with resilience while acknowledging the complexities of the digital marketplace.

5.3 Takeaways for fostering safe and positive teen-friendly spaces

In order to achieve the growth described above, communities must establish robust frameworks that prioritize stability and safety. In this section, we identify two key takeaways for fostering such an environment: continuous guidance, empowering teen developers to handle challenges, and collaborative stakeholder involvement.

5.3.1 ***Empowering teen developers to handle challenges.*** The decentralized nature of developer communities on Roblox creates both opportunities and challenges for teen developers. While these communities foster creativity and peer-to-peer learning, they also leave teens vulnerable to risks such as financial conflicts, copyright issues, and scams, which can be difficult to navigate without guidance. Instead of adopting a top-down governance model that could undermine teen agency and autonomy in managing their spaces, Roblox should focus on empowering teen developers to handle these challenges effectively. Roblox can play a critical role by educating developers about community norms and setting examples of good community policies—not just showcasing successful games but also showcasing communities with successful governance. Clear rules addressing financial disputes and intellectual property concerns should be established, alongside robust reporting and peer-review mechanisms for identifying and resolving suspicious activities.

Teen developers should also be encouraged to collaborate in creating solutions as a primary stakeholder. For example, developer communities use peer review mechanisms to identify scams, share knowledge about recognizing common scam patterns, and clarify realistic commission expectations to prevent exploitation. Roblox could further support community leaders by providing educational resources on effective moderation strategies and creating incentives for experienced members to mentor newcomers. AI tools could assist by explaining ongoing conversations to newcomers, addressing accessibility challenges, and easing their integration into the community. By focusing on *empowerment* of teen developers rather than on control, Roblox can foster resilience-based learning [50], and community sustainability as members come in and out. Though it is impossible to eliminate all risks, equipping teen developers with the tools, knowledge, and community support to navigate the challenges of the community can help them grow both creatively and responsibly.

5.3.2 ***Continuous stakeholder support both offline and online.*** Teen developers demonstrate remarkable agency within their communities, which leads to collaborative learning and self-directed socialization. The unique opportunities offered by platforms like Roblox—ranging from exploring diverse games and monetization opportunities to connecting with peers—serve as a gateway for broader offline engagement. For some participants, online experiences inspired decisions to attend relevant schools or participate in offline meetups, while for some participants, their school friends led them to join online communities in the first place. This depicts the organic interplay between the digital and physical worlds [67].

Additionally, participants emphasized how supportive online environments often benefit from robust offline support networks, including teachers, family, and peers, which play a critical role in fostering their growth and helping them navigate challenges. This seamless transition between online and offline support highlights the need for a cohesive, collaborative approach among stakeholders.

To nurture teen developers effectively, all stakeholders—parents, educators, peers, platform providers, and developers themselves—must work together to build an ecosystem that bridges online creativity with offline guidance. To build a more broadly supportive ecosystem, Roblox must position itself as a serious platform for technical development, earning respect from both users and external stakeholders. By integrating Roblox's educational value in prioritizing developer safety, Roblox can strengthen its supportive role. Likewise, parents and schools should recognize and acknowledge the significance of Roblox development when students showcase their achievements. Bridging online creativity with offline guidance through this continuous support network is crucial for fostering a positive environment for teen developers.

Effective management of potential issues on Roblox demands active involvement from all stakeholders: Roblox, host platforms for developer communities, developer community moderators, parents, schools, and teen developers. To create an inclusive environment, it is crucial to implement participatory governance models that ensure every voice, especially those of teen developers, is heard in shaping community policies [73]. This collaborative approach may involve regular feedback sessions, open forums, and advisory panels where all stakeholders can contribute to developing community policies and support mechanisms. By fostering these participatory practices, stakeholders can enhance the community experience, address emerging issues, and build a more supportive and engaging environment for teen developers. Such efforts can also reduce the normalization of harmful game design within the Roblox ecosystem, mitigating one of the platform's most significant risks to players and fostering a safer, more constructive space for all users.

5.4 Future Work

Our study reveals promising growth opportunities for teenagers in game development, socializing, and career building in platforms like Roblox but also uncovers several challenges. To address these, future research should aim to include a more diverse sample or utilize large-scale chat data analysis from developer communities. This would provide a broader perspective on the Roblox creator ecosystem and gain insights into underrepresented developers. While issues like child safety and grooming were minimally reported in our sample, they may be more significant in a larger study. In addition, expanding to explore other teenage communities—such as social media creators or school-based learning platforms—could reveal different motivations and interaction styles due to their unique contexts. Understanding these differences, including how to better support child creators, remains an important area for further investigation.

6 CONCLUSION

For teenagers, creating games is a valuable and engaging method for fostering skills in computational thinking, collaboration, and creative problem-solving. Despite the increased accessibility of game development, many teen developers encounter challenges due to the diverse skill sets required. Based on interviews with 18 teen Roblox developers, we show how online communities can provide significant benefits, including access to learning resources, opportunities for collaboration, and the growth of transferable skills beyond the gaming platform. However, these communities also present challenges, often stemming from problematic behaviors exhibited by other users within the community, unsupportive guardians, or community environment factors such as school-life balance. These findings highlight the need for more structured guidance and best practices to maximize the positive impacts of online communities and provide a safer space for teen developers in their developmental journeys. We hope our work can further spur discussion on the nuances of designing positive online social experiences for teen developers.

ACKNOWLEDGMENTS

This research was supported by a grant from the National Research Foundation of Korea (No. RS-2024-00348993). We gratefully acknowledge the Roblox developer community members for their invaluable insights and active participation throughout our research. We also thank @tlllik and @GODPOTATO_Official, who contributed their creative works shown in Figure 1(a) and (c), respectively, and wish to be acknowledged.

REFERENCES

[1] Sana Ali, Hiba Haykal, and Enaam Youssef. 2021. Child Sexual Abuse and the Internet—A Systematic Review. *Human Arenas* 4 (06 2021). https://doi.org/10.1007/s42087-021-00228-9

[2] Cecilia R Aragon, Sarah S Poon, Andrés Monroy-Hernández, and Diana Aragon. 2009. A tale of two online communities: Fostering collaboration and creativity in scientists and children. In *Proceedings of the seventh ACM conference on Creativity and cognition*. 9–18.

[3] Marina Umaschi Bers, Amanda Strawhacker, and Amanda Sullivan. 2022. The state of the field of computational thinking in early childhood education. (2022).

[4] Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative research in psychology* 3, 2 (2006), 77–101.

[5] Karen Brennan. 2021. How kids manage self-directed programming projects: Strategies and structures. *Journal of the Learning Sciences* 30, 4-5 (2021), 576–610.

[6] Bharadwaj Kuruba Bulley, Shravika Tirumala, Bhavani Shankar Mahamkali, Md Nazmus Sakib, Saquib Ahmed, and Sanorita Dey. 2024. The Dual Role of Student and Creator: Exploring the TikTok Experience. In *Companion Publication of the 2024 Conference on Computer-Supported Cooperative Work and Social Computing*. 635–641.

[7] Debarshi Chatterji, Jeffrey C Carver, and Nicholas A Kraft. 2016. Code clones and developer behavior: results of two surveys of the clone research community. *Empirical Software Engineering* 21 (2016), 1476–1508.

[8] Ruijia Cheng, Sayamindu Dasgupta, and Benjamin Mako Hill. 2022. How Interest-Driven Content Creation Shapes Opportunities for Informal Learning in Scratch: A Case Study on Novices' Use of Data Structures. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems* (New Orleans, LA, USA) *(CHI '22)*. Association for Computing Machinery, New York, NY, USA, Article 228, 16 pages. https://doi.org/10.1145/3491102.3502124

[9] Jithin Cheriyan, Bastin Tony Roy Savarimuthu, and Stephen Cranefield. 2021. Towards offensive language detection and reduction in four Software Engineering communities. In *Proceedings of the 25th International Conference on Evaluation and Assessment in Software Engineering* (Trondheim, Norway) *(EASE '21)*. Association for Computing Machinery, New York, NY, USA, 254–259. https://doi.org/10.1145/3463274.3463805

[10] Min Chou and J Frank. 2018. Designing of online communities of practice to facilitate collaborative learning. In *2018 5th international symposium on emerging trends and Technologies in Libraries and Information Services (ETTLIS)*. IEEE, 100–104.

[11] Sayamindu Dasgupta and Benjamin Mako Hill. 2017. Scratch Community Blocks: Supporting Children as Data Scientists. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (Denver, Colorado, USA) *(CHI '17)*. Association for Computing Machinery, New York, NY, USA, 3620–3631. https://doi.org/10.1145/3025453.3025847

[12] Tanya E Davison and Marita P McCabe. 2006. Adolescent body image and psychosocial functioning. *The Journal of social psychology* 146, 1 (2006), 15–30.

[13] Jill Denner, Linda Werner, Shannon Campe, and Eloy Ortiz. 2014. Pair programming: Under what conditions is it advantageous for middle school students? *Journal of Research on Technology in Education* 46, 3 (2014), 277–296.

[14] Adoración Díaz-López, Vanessa Caba-Machado, Juan Manuel Machimbarrena, Jessica Ortega-Barón, Priscila Pérez-Rodríguez, and Joaquín González-Cabrera. 2024. Dysfunctional risks of the internet and their overlap in the different stages of adolescence. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace* 18, 1 (2024).

[15] Brooke Erin Duffy. 2017. *(Not) getting paid to do what you love: Gender, social media, and aspirational work*. Yale University Press.

[16] Isabella Ferreira, Jinghui Cheng, and Bram Adams. 2021. The "Shut the f**k up" Phenomenon: Characterizing Incivility in Open Source Code Review Discussions. *Proc. ACM Hum.-Comput. Interact.* 5, CSCW2, Article 353 (oct 2021), 35 pages. https://doi.org/10.1145/3479497

[17] Deborah Fields, Michael Giang, and Yasmin Kafai. 2013. Understanding collaborative practices in the Scratch online community: Patterns of participation among youth designers. (2013).

[18] Deborah A Fields, Katarina Pantic, and Yasmin B Kafai. 2015. "I have a tutorial for this" the language of online peer support in the scratch programming community. In *Proceedings of the 14th International Conference on Interaction Design and Children*. 229–238.

[19] Louise P Flannery, Brian Silverman, Elizabeth R Kazakoff, Marina Umaschi Bers, Paula Bontá, and Mitchel Resnick. 2013. Designing ScratchJr: Support for early childhood learning through computer programming. In *Proceedings of the 12th international conference on interaction design and children*. 1–10.

[20] Diana Freed, Natalie N. Bazarova, Sunny Consolvo, Eunice J Han, Patrick Gage Kelley, Kurt Thomas, and Dan Cosley. 2023. Understanding Digital-Safety Experiences of Youth in the U.S.. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (Hamburg, Germany) *(CHI '23)*. Association for Computing Machinery, New York, NY, USA, Article 191, 15 pages. https://doi.org/10.1145/3544548.3581128

[21] Guo Freeman, Lingyuan Li, Nathan Mcneese, and Kelsea Schulenberg. 2023. Understanding and Mitigating Challenges for Non-Profit Driven Indie Game Development to Innovate Game Production. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (Hamburg, Germany) *(CHI '23)*. Association for Computing Machinery, New York, NY, USA, Article 293, 16 pages. https://doi.org/10.1145/3544548.3580976

[22] Guo Freeman, Nathan McNeese, Jeffrey Bardzell, and Shaowen Bardzell. 2020. "Pro-Amateur"-Driven Technological Innovation: Participation and Challenges in Indie Game Development. *Proc. ACM Hum.-Comput. Interact.* 4, GROUP, Article 04 (jan 2020), 22 pages. https://doi.org/10.1145/3375184

[23] Guo Freeman and Nathan J McNeese. 2019. Exploring indie game development: Team practices and social experiences in A creativity-centric technology community. *Computer Supported Cooperative Work (CSCW)* 28, 3 (2019), 723–748.

[24] Kazjon Grace and Mary Maher. 2014. Towards computational co-creation in modding communities. In *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment*, Vol. 10. 15–20.

[25] Tobias Gritschacher and Wolfgang Slany. 2012. Standing on the shoulders of their peers: success factors for massive cooperation among children creating open source animations and games on their smartphones. In *Proceedings of the 11th International Conference on Interaction Design and Children*. 264–267.

[26] Mary Ann Harlan, Christine Bruce, and Mandy Lupton. 2012. Teen content creators: Experiences of using information to learn. *Library Trends* 60, 3 (2012), 569–587.

[27] Sharon Heung, Lucy Jiang, Shiri Azenkot, and Aditya Vashistha. 2024. "Vulnerable, Victimized, and Objectified": Understanding Ableist Hate and Harassment Experienced by Disabled Content Creators on Social Media. In *Proceedings of the CHI Conference on Human Factors in Computing Systems* (Honolulu, HI, USA) *(CHI '24)*. Association for Computing Machinery, New York, NY, USA, Article 744, 19 pages. https://doi.org/10.1145/3613904.3641949

[28] Alexis Hiniker, Bongshin Lee, Julie A. Kientz, and Jenny S. Radesky. 2018. Let's Play! Digital and Analog Play between Preschoolers and Parents. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (Montreal QC, Canada) *(CHI '18)*. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3173574.3174233

[29] Elina H Hwang, Param Vir Singh, and Linda Argote. 2015. Knowledge sharing in online communities: Learning to cross geographic and hierarchical boundaries. *Organization Science* 26, 6 (2015), 1593–1611.

[30] Henry Jenkins. 2009. *Confronting the challenges of participatory culture: Media education for the 21st century*. The MIT press.

[31] Henry Jenkins, Mizuko Ito, et al. 2015. *Participatory culture in a networked era: A conversation on youth, learning, commerce, and politics*. John Wiley & Sons.

[32] Yasmin B Kafai, Deborah A Fields, Ricarose Roque, Quinn Burke, and Andres Monroy-Hernandez. 2012. Collaborative agency in youth online and offline creative production in Scratch. *Research and Practice in Technology Enhanced Learning* 7, 2 (2012), 63–87.

[33] Denisa Kera. 2012. Hackerspaces and DIYbio in Asia: connecting science and community with open data, kits and protocols. *Journal of Peer Production* 2, Jun (2012), 1–8.

[34] Serhat Bahadır Kert, Mehmet Fatih Erkoç, and Sabiha Yeni. 2020. The effect of robotics on six graders' academic achievement, computational thinking skills and conceptual knowledge levels. *Thinking Skills and Creativity* 38 (2020), 100714.

[35] Yubo Kou and Xinning Gui. 2023. Harmful design in the metaverse and how to mitigate it: A case study of user-generated virtual worlds on roblox. In *Proceedings of the 2023 ACM Designing Interactive Systems Conference*. 175–188.

[36] Yubo Kou, Yingfan Zhou, Zinan Zhang, and Xinning Gui. 2024. The Ecology of Harmful Design: Risk and Safety of Game Making on a Metaverse Platform. In *Proceedings of the 2024 ACM Designing Interactive Systems Conference*. 1842–1856.

[37] Kathleen Kuehn and Thomas F Corrigan. 2013. Hope labor: The role of employment prospects in online social production. *The political economy of communication* 1, 1 (2013).

[38] Deepak Kumar, Jeff Hancock, Kurt Thomas, and Zakir Durumeric. 2023. Understanding the Behaviors of Toxic Accounts on Reddit. In *Proceedings of the ACM Web Conference 2023* (Austin, TX, USA) *(WWW '23)*. Association for Computing Machinery, New York, NY, USA, 2797–2807. https://doi.org/10.1145/3543507.3583522

[39] Linda C Li, Jeremy M Grimshaw, Camilla Nielsen, Maria Judd, Peter C Coyte, and Ian D Graham. 2009. Evolution of Wenger's concept of community of practice.

Implementation science 4 (2009), 1–8.

[40] Yinmiao Li, Jennifer Nwogu, Amanda Buddemeyer, Jaemarie Solyst, Jina Lee, Erin Walker, Amy Ogan, and Angela E.B. Stewart. 2023. "I Want to Be Unique From Other Robots": Positioning Girls as Co-creators of Social Robots in Culturally-Responsive Computing Education. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (Hamburg, Germany) *(CHI '23)*. Association for Computing Machinery, New York, NY, USA, Article 441, 14 pages. https://doi.org/10.1145/3544548.3581272

[41] Breanne K. Litts, Apoorva Chauhan, Chase K. Mortensen, and Kamaehu Matthias. 2019. I'm Drowning in Squirrels! How Children Embody and Debug Computational Algorithms Through Designing Mixed Reality Games. In *Proceedings of the 18th ACM International Conference on Interaction Design and Children* (Boise, ID, USA) *(IDC '19)*. Association for Computing Machinery, New York, NY, USA, 267–273. https://doi.org/10.1145/3311927.3323129

[42] Andres Lombana Bermudez, Sandra Cortesi, Christian Fieseler, Urs Gasser, Alexa Hasse, Gemma Newlands, and Sarah Wu. 2020. Youth and the digital economy: Exploring youth practices, motivations, skills, pathways, and value creation. (2020).

[43] Yao Lu, Xinjun Mao, Minghui Zhou, Yang Zhang, Zude Li, Tao Wang, Gang Yin, and Huaimin Wang. 2021. Motivation under gamification: An empirical study of developers' motivations and contributions in stack overflow. *IEEE transactions on software engineering* 48, 12 (2021), 4947–4963.

[44] Richard Martinez and Kurt Squire. 2024. Engaging recently incarcerated and gang affiliated Black and Latino/a young adults in designing social collocated applications for mixed reality smart glasses through community-based participatory design workshops.. In *Proceedings of the CHI Conference on Human Factors in Computing Systems* (Honolulu, HI, USA) *(CHI '24)*. Association for Computing Machinery, New York, NY, USA, Article 871, 17 pages. https://doi.org/10.1145/3613904.3642895

[45] Anna May, Johannes Wachs, and Anikó Hannák. 2019. Gender differences in participation and reward on Stack Overflow. *Empirical Software Engineering* 24 (2019), 1997–2019.

[46] Courtney Miller, Sophie Cohen, Daniel Klug, Bogdan Vasilescu, and Christian KaUstner. 2022. "Did you miss my comment or what?": understanding toxicity in open source discussions. In *Proceedings of the 44th International Conference on Software Engineering* (Pittsburgh, Pennsylvania) *(ICSE '22)*. Association for Computing Machinery, New York, NY, USA, 710–722. https://doi.org/10.1145/3510003.3510111

[47] Gina Neff. 2012. *Venture labor: Work and the burden of risk in innovative industries*. MIT press.

[48] Guardian News and Media. 2022. The trouble with Roblox, the video game empire built on child labour. https://www.theguardian.com/games/2022/jan/09/the-trouble-with-roblox-the-video-game-empire-built-on-child-labour. Accessed: February 24, 2025.

[49] Ruchi Panchanadikar and Guo Freeman. 2024. " I'm a Solo Developer but AI is My New Ill-Informed Co-Worker": Envisioning and Designing Generative AI to Support Indie Game Development. *Proceedings of the ACM on Human-Computer Interaction* 8, CHI PLAY (2024), 1–26.

[50] Jinkyung Park, Mamtaj Akter, Naima Samreen Ali, Zainab Agha, Ashwaq Alsoubai, and Pamela Wisniewski. 2023. Towards Resilience and Autonomy-Based Approaches for Adolescents Online Safety. *Available at SSRN 4608406* (2023).

[51] Joon Sung Park, Joseph Seering, and Michael S. Bernstein. 2022. Measuring the Prevalence of Anti-Social Behavior in Online Communities. *Proc. ACM Hum.-Comput. Interact.* 6, CSCW2, Article 451 (nov 2022), 29 pages. https://doi.org/10.1145/3555552

[52] Hector Postigo. 2010. Modding to the big leagues: Exploring the space between modders and the game industry. *First Monday* (2010).

[53] Sara Rijo-García, Eduardo Segredo, and Coromoto León. 2022. Computational thinking and user interfaces: A systematic review. *IEEE Transactions on Education* 65, 4 (2022), 647–656.

[54] Kathryn E. Ringland, Christine T. Wolf, Heather Faucett, Lynn Dombrowski, and Gillian R. Hayes. 2016. "Will I always be not social?": Re-Conceptualizing Sociality in the Context of a Minecraft Community for Autism. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (San Jose, California, USA) *(CHI '16)*. Association for Computing Machinery, New York, NY, USA, 1256–1269. https://doi.org/10.1145/2858036.2858038

[55] Ricarose Roque, Sayamindu Dasgupta, and Sasha Costanza-Chock. 2016. Children's civic engagement in the Scratch online Community. *Social Sciences* 5, 4 (2016), 55.

[56] Cary J Roseth, David W Johnson, and Roger T Johnson. 2008. Promoting early adolescents' achievement and peer relationships: the effects of cooperative, competitive, and individualistic goal structures. *Psychological bulletin* 134, 2 (2008), 223.

[57] Andrew Ross. 2012. In search of the lost paycheck. In *Digital labor*. Routledge, 13–32.

[58] Samantha Shorey, Benjamin Mako Hill, and Samuel Woolley. 2021. From hanging out to figuring it out: Socializing online as a pathway to computational thinking. *New Media & Society* 23, 8 (2021), 2327–2344.

[59] DOROTHY G SINGER. 2006. ROBERTA MICHNICK GOLINKOFF, KATHY HIRSH-PASEK. *Play= learning: How play motivates and enhances children's cognitive and social-emotional growth* (2006), 1.

[60] Petr Slovak, Katie Salen, Stephanie Ta, and Geraldine Fitzpatrick. 2018. Mediating conflicts in minecraft: Empowering learning in online multiplayer games. In *Proceedings of the 2018 CHI conference on human factors in computing systems*. 1–13.

[61] Mohamed Soliman, Amr Rekaby Salama, Matthias Galster, Olaf Zimmermann, and Matthias Riebisch. 2018. Improving the Search for Architecture Knowledge in Online Developer Communities. In *2018 IEEE International Conference on Software Architecture (ICSA)*. 186–18609. https://doi.org/10.1109/ICSA.2018.00028

[62] Olli Sotamaa. 2010. When the game is not enough: Motivations and practices among computer game modding culture. *Games and Culture* 5, 3 (2010), 239–255.

[63] Kaveri Subrahmanyam and Patricia Greenfield. 2008. Online communication and adolescent relationships. *The future of children* (2008), 119–146.

[64] Ching-Ying Sung, Fu-Yin Cherng, Yi-Lun Chiu, Peng-Hsi Chen, and Bing-Yu Chen. 2024. 3CPEs: Concrete Computational Concepts Programming Environments for Elementary Computer Science Education. In *Extended Abstracts of the 2024 CHI Conference on Human Factors in Computing Systems (CHI EA '24)*. Association for Computing Machinery, New York, NY, USA, Article 13, 7 pages. https://doi.org/10.1145/3613905.3650833

[65] Theresa Jean Tanenbaum, Amanda M. Williams, Audrey Desjardins, and Karen Tanenbaum. 2013. Democratizing technology: pleasure, utility and expressiveness in DIY and maker practice. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Paris, France) *(CHI '13)*. Association for Computing Machinery, New York, NY, USA, 2603–2612. https://doi.org/10.1145/2470654.2481360

[66] Tangila Islam Tanni, Mamtaj Akter, Joshua Anderson, Mary Jean Amon, and Pamela J. Wisniewski. 2024. Examining the Unique Online Risk Experiences and Mental Health Outcomes of LGBTQ+ versus Heterosexual Youth. In *Proceedings of the CHI Conference on Human Factors in Computing Systems* (Honolulu, HI, USA) *(CHI '24)*. Association for Computing Machinery, New York, NY, USA, Article 867, 21 pages. https://doi.org/10.1145/3613904.3642509

[67] T.L. Taylor. 2009. *Play between worlds: Exploring online game culture*. MIT press.

[68] Tina Lynn Taylor. 2009. The assemblage of play. *Games and culture* 4, 4 (2009), 331–339.

[69] Giovanni Maria Troiano, Sam Snodgrass, Erinç Argımak, Gregorio Robles, Gillian Smith, Michael Cassidy, Eli Tucker-Raymond, Gillian Puttick, and Casper Harteveld. 2019. Is my game OK Dr. Scratch? Exploring programming and computational thinking development via metrics in student-designed serious games for STEM. In *Proceedings of the 18th ACM international conference on interaction design and children*. 208–219.

[70] Eli Tucker-Raymond, Gillian Puttick, Michael Cassidy, Casper Harteveld, and Giovanni M Troiano. 2019. "I Broke Your Game!": critique among middle schoolers designing computer games about climate change. *International Journal of STEM Education* 6 (2019), 1–16.

[71] Bogdan Vasilescu, Alexander Serebrenik, Prem Devanbu, and Vladimir Filkov. 2014. How social Q&A sites are changing knowledge sharing in open source software communities. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing* (Baltimore, Maryland, USA) *(CSCW '14)*. Association for Computing Machinery, New York, NY, USA, 342–354. https://doi.org/10.1145/2531602.2531659

[72] Bogdan Vasilescu, Stef Van Schuylenburg, Jules Wulms, Alexander Serebrenik, and Mark GJ van den Brand. 2014. Continuous integration in a social-coding world: Empirical evidence from GitHub. In *2014 IEEE international conference on software maintenance and evolution*. IEEE, 401–405.

[73] Ge Wang, Jun Zhao, Max Van Kleek, and Nigel Shadbolt. 2023. 12 Ways to Empower: Designing for Children's Digital Autonomy. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–27.

[74] S Craig Watkins and Alexander Cho. 2018. *The digital edge: How Black and Latino youth navigate digital inequality*. New York University Press.

[75] Pamela Wisniewski, Haiyan Jia, Na Wang, Saijing Zheng, Heng Xu, Mary Beth Rosson, and John M. Carroll. 2015. Resilience Mitigates the Negative Effects of Adolescent Internet Addiction and Online Risk Exposure. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (Seoul, Republic of Korea) *(CHI '15)*. Association for Computing Machinery, New York, NY, USA, 4029–4038. https://doi.org/10.1145/2702123.2702240

[76] Zinan Zhang, Xinning Gui, and Yubo Kou. 2024. Understanding and Mitigating Harmful Design in User-Generated Virtual Worlds. *arXiv preprint arXiv:2405.05922* (2024).

A APPENDIX

A.1 Final Themes

Figure 4 presents the main themes from the interviews.

A.2 Full Interview Questions

The interview started by explaining this research and asking for consent (and communicating that participants could drop out anytime if they felt uncomfortable). It was semi-structured, beginning with a core set of questions. Questions were modified or added in response to participants' answers, exploring interesting threads more deeply.

Warm-up

1. What's your favorite game in Roblox?
   (a) What is the genre?
   (b) Do you play with friends?
   (c) What would you recommend for a newbie?
2. Can you show me your memorable Roblox avatar you liked?
3. Who are your favorite Roblox YouTubers or TikTok influencers?

Becoming a game creator

Main paper Section	Category	Theme	Description
3.1 Participants information	Developer Experience	Experience in Roblox Developing (Years)	How long the participants experienced game developing in Roblox
		Made Own Creations	What creations the participants had made
		Creation process	How participants made their creations
		Idea behind Creations	How the participants acheived the ideas for the creations
	Motivation for Developing	Feeling Fun	Enjoy problem-solving, makes it fun to develop
		Community Members Reactions	Feel satisfied by seeing the reactions of their creations from the community members
		Made Game's User Reactions	Feel satisfied by seeing the reactions of their creations from the game players
		Creation itself	The activity of creating itself gives motivation
		Financial Income	Financial income from their creations gives motivation
4.1 How do they use online developer communities (RQ1)	Community Usage	Participant Usage of Communities	How participants utilize and communicate in various communities
		How they got to know the community	What steps the participants underwent to access the community
	Changes in Use of Community	Changes in Use of Community	Any change of online community for game development that the participant uses
	Community-wise Differences	Community-wise Differences	Differences among the various online communities that participants use
	Cross Platform Creator	Process of becoming a Multiple Platforms Creator	How participants became a multiple platform creator
		Reason for being Creators of Other Platforms	Why participants have became a creator on various platforms
		Challenges of being a Cross Platform Creators	Several challenges that participants faced as cross platform creators
4.2 Benefits from participating in developer communities (RQ2)	Community Benefits	Learning Technical Knowledge	Learned technical knowledge in the community from asking questions or existing posts
		Teaching Technical Knowledge	Teached technical knowledge to other users in the community
		Feel Fun Using the Community	Felt fun and engaging while using the community
		Collaboration with Other Users in the Community	Earn opportunities to collaborate creating games with other users in the community
		Opportunities for Monetization	Earn opportunities to earn financial profit through various ways in the community
		Feel Sense of Belonging to the Community	Felt the sense of belonging to other users within the community
		Make Friends in the Community	Become friends with other users within the community
		Get Motivation on Game Development from the Community	Get motivation on game development through various ways from the community
	Growth	Growth in Technical Skills	Can grow technical skills by participating in developer communities
		Experiences for Future Career	Earn opportunities in the community for getting experiences related to future career
		Growth in Soft Social Skills	Can grow soft social skills through communicating with other users in the community
	Career Paths	Continuing Skills learned for Other Game Developing	Continuing expanding skills learned for various game development
		Continuing Roblox Development	Prefer continuing game development through Roblox
		No longer involved in game development	Decided to no longer be involved in the game development field
4.3 Challenges from participating developer communities and associated coping strategies (RQ3)	Community Challenges	Financial Scam	Financial scams happen within the community
		Inappropriate Community Users	Some community users show inappropriate behaviors related to online harm
		Hard to Find Collaborators	Find it hard to recruit appropriate collaborators within the community
		Question Not Answered	Participants' questions are not answered or solved through the community
		Collaboration Stopped	Collaboration between the community users sometimes stop
		Intellectual Property	Intellectual property of the creations are violated from other community users
		Balance between School and Roblox	Balancing between school life and community activities are a challenge
		Young Developers Consisting Majority of Community	Young developers consist the majority of the community
		Conflicts in Community due to Age	Conflicts between community users happen due to the reason of age difference
		Newcomer Adjusting	Newcomers of the community feel it hard to adjust to the atmosphere
	Language Barrier	Lack of Ability to Communicate	Language barriers lead to a lack of ability to communicate with other community users
		Lack of Resources	Feel it hard to access various resources due to language barrier
	Offline Friends, Teachers and Parent Relationship	Supportive Reactions from Offline	Get supportive reaction from offline relationships and communication
		Unsupportive Reactions from Offline	Get unsupportive reaction from offline relationships and communication
		No Communication with Offline	Do not communicate with offline relationships
		Expand Activities related to Game Development in Offline	Do activities related to game development in offline environment
Themes from the interviews not discussed in Findings	Misc	Better designs for game development	Proposal for better designs of the game developing in Roblox or developer communities
		Collaboration Process	Process of collaboration between game developers
		Other experiences with game development	Participants shared past experiences with game development
	AI Usage in Roblox Development	AI Usage Experience	Explanation on how participants utilized AI for game development
		Positive on AI Usage	Positive opinion or reaction towards the use of AI for game development
		Neutral on AI Usage	Neutral opinion or reaction towards the use of AI for game development
		Negative on AI Usage	Negative opinion or reaction towards the use of AI for game development

Figure 4: The final themes from interviews with 18 teen Roblox developers. The themes are organized into three major findings areas: (1) Community Use Patterns (RQ1, Community Usage, Changes in Use, Developer Experience), (2) Community Benefits (RQ2, Growth, Community Benefits, Career Paths), (3) Community Challenges (RQ3, Community Challenges, Language Barriers, Offline Relationships). Each category connects to corresponding sections in the Main Paper, including a few themes that emerged from the interviews but weren't central to our findings.

1. What's the coolest item/game you've made in Roblox?
   (a) Did the idea for the item/game just come into mind?
2. Could you tell me more about how you made the item/game?
3. Have you collaborated with anyone when making the item/game?
4. How many years did it take to make the item/game?
5. How many items/games have you made? Can you show me some?

Community-Related

1. When you made an item/game, were there times you were stuck?
2. Where did you go when you're stuck?
   (a) Did you seek help online?
   (b) How often did you go there?
3. Now, could you recall the 1st time you made something in Roblox? Where did you get help then?
   (a) How did you get to know there?
4. Did you have any struggle when you 1st joined *(channel mentioned during the interview)*?
   (a) Have you ever felt awkward or confused as a newbie?
5. (If the communities used have changed) Why do you now go to different communities now?
   (a) How do you spend your time?
6. (If the communities used have not changed) Why do you use the same channel?
   (a) What do you like about it?
   (b) Have you thought about joining others?
   (c) How do you spend your time there?
7. Do you find it easy to communicate your intention through these channels now?
   (a) Are you happy with the way the *(channel mentioned during the interview)* is now?
8. Looking back, for a newbie trying to make an item/a game, where would you recommend?
9. What would you miss if *(channel mentioned during the interview)* didn't exist?
10. Do you feel you're learning and achieving your goals by being part of *(channel mentioned during the interview)*?
11. Do you think *(channel mentioned during the interview)* has influenced your work in Roblox?
    (a) Has it influenced your real life too?

Safety-Related

1. Do you know others' ages in those *(channel mentioned during the interview)*?
2. Have you felt someone is older or younger in *(channel mentioned during the interview)*?
   (a) Why?
   (b) Have you ever talked about your age?
3. Have you ever felt suspicious of *(channel mentioned during the interview)* as a newbie? Or even now?
4. How close do you feel to the other members of the channel?
5. Do you think there should be a separate channel just for kids?

Offline-Related

1. Have you shown what you made in Roblox to your parents or offline friends? Why or why not?

Concluding thoughts

1. What are some things Roblox developer communities could do better?
2. Do you plan to continue developing in Roblox?
3. Is there anything you want to share with us?

Thank you so much. I would like to move on to the last topic.

Received September 2024; revised December 2024; accepted January 2025