The University of Washington Information School (PI: Jason Yip) requests **$249,917** from the *National Leadership Grants for Libraries* program for an implementation project grant (Goal 1: Objective 1.1). The overall need is to equip children (ages 6 - 13) with the resilience and knowledge they need to combat misinformation. The intended impact is to **co-design and nationally disseminate a set of innovative online play-based digital activities for children around combating misinformation in libraries**. We will develop online intergenerational co-design teams led by librarians and teens around misinformation. The organizations are The Seattle Public Library (SPL), San Diego Public Library (SDPL), and WA and CO state rural libraries.

1. Project Justification:

Our project implementation is appropriate for **Goal 1**: Build the workforce and institutional capacity for managing the national information infrastructure and serving the information and education needs of the public. This implementation project will overall contribute to National Leadership Grant goals by generating positive societal impact through providing new tools, activities, curriculum, and information to help librarians combat misinformation. The project also fits under **Objective 1.1**. Specifically, our project focuses on providing replicable library programs and activities to support the creation of informal STEM learning products. We are also developing a curriculum to help librarians develop their own learning resources around misinformation for their child patrons.

Mis- and disinformation (hereafter misinformation) is a major threat to a healthy and thriving democratic society. Misinformation is false or inaccurate information, whereas disinformation involves the intentional spreading of misinformation motivated by financial, political, or other agenda. Educational efforts to equip individuals with the skills needed to become resilient to misinformation are critical, with libraries uniquely positioned to play a proactive role. The challenge is to develop effective strategies and programs for the diverse population groups they serve. To date, most attention has focused on adults and older youth. Children, for our purposes ages 6 - 13, have largely been ignored. What experiences do they have with misinformation? How do they perceive misinformation? What strategies might they already employ to combat misinformation? And most importantly, how can libraries better support children at this formative point in their development and increasing exposure to misinformation? (Wu et al., 2019).

1.1 Need 1: Children and Misinformation: Children today are growing up with digital devices, playing online games, and accessing social media sites at younger ages. COVID-19 has only accelerated this movement as more parents are allowing their children to spend more time online. This trend corresponds to an increasing flow of misinformation on these platforms that target youth, including *YouTube*, *Roblox*, and *TikTok*. Children can also be spreaders, amplifiers, and creators (both intentional and unintentional) of misinformation. Children can have a difficult time determining the blurry line of irony, satire, parody, falsehoods, and manipulation. They are also targets of misinformation efforts (Howard et al., 2021). The issue of misinformation is not a question of "how do we avoid misinformation?" but how children navigate through a world of digital misinformation. Instead of children being victims and targets of misinformation, they need to be opponents and advocates to fact-check and myth-bust.

While studies on children and internet usage exist, there is a dearth of research on children and misinformation, such as how and when do children come into contact with it, how do children perceive it, how does misinformation affect children, and what strategies do children use, if any, to navigate it. A UNICEF report concluded, there is a "***paucity of data on this topic***" (Howard et al., 2021). The little that is known suggests reasons for concern. Howard et al. (2021) finds "children may be particularly vulnerable to misinformation because their maturity and cognitive capacities are still evolving." A recent *Scientific American* article, commenting on a Stanford study, showed that "80% of middle schoolers believed that an advertisement labeled as sponsored content was actually a news story." It also found that "less than 20% of high schoolers seriously questioned spurious claims in social media" (Moyer, 2022). These data support other studies, such as one of US high-school students showing that "52% believed that a grainy video claiming to show ballot-stuffing in the 2016

Democratic primaries constituted 'strong evidence' of voter fraud in the US (the video was actually shot in Russia), 96% failed to consider that ties to the fossil-fuel industry might affect the credibility of a website about climate change, and 66% couldn't tell the difference between news stories and 'sponsored content' (i.e. adverts) on a website" (Howard et al., 2021).

For the purposes of this proposal, one of the more important findings, according to a study in the *British Journal of Developmental Psychology*, is that "***age 14 is when kids often start believing in unproven conspiratorial ideas***" (Moyer, 2022). What happens before the age of 14 that conditions children to believe false information? This project aims to contribute to filling this knowledge gap. From a funds of knowledge perspective (González,& Amanti, 2006), we do not currently know what assets and strategies children already use to deal with misinformation. There could be good strategies we do not know about.

1.2   Need 2: Misinformation and Literacies: From an educational perspective we also find a lack of effective approaches for helping people navigate misinformation, a challenge that becomes even more pronounced when it comes to children. "**Overall there are very few data showing the best way to teach children to tell fact from fiction** (Moyer, 2022)." In library and information sciences (LIS), there has been a long tradition to improve people's information literacy (IL) to better prepare the user to search, obtain, and evaluate information (Sproles et al., 2013). The underlying assumption in this work is that improving IL will allow users to recognize and appropriately evaluate misinformation, and IL instructions often includes checklist approaches guided by acronyms and binary questions (Caulfield, 2018) (e.g., CRAAP (Currency, Relevance, Authority, Accuracy, Purpose); BEAM (Background, Exhibit, Argument, Method) framework (Fielding, 2019; Roach-Freiman, 2021), situated in academic settings.

Current research on misinformation in psychology, sociology, political science, and education reveals critical limitations to these strategies because of how misinformation affects the user (Sullivan, 2018; Young et al., 2020). Research highlights that an individual's identity, sociocultural context, and emotions all influence how people process and accept information (Bail, 2016; Darner, 2019; Marwick, 2018; Weeks, 2015). The information environment has evolved into a complex networked environment in which much of the information is pushed to the users, rather than them seeking out information themselves (Calo et al., 2021). It is not enough to tailor IL curriculum for children, since IL-based approaches themselves are not proving effective for combating misinformation among older youth or adults in isolation. The UNICEF report (Howard et al., 2021) recommends **supporting media and information literacy programs, revising a national curriculum if needed, and creating training and education opportunities for parents, caregivers, and educators.** This need is urgent, as children are growing up in the age of misinformation and need to learn quickly and strategically how to encounter misinformation. Our project seeks to fill this gap by co-creating and designing strategies against misinformation WITH and FOR children.

1.3   Need 3: Libraries, Families, and Misinformation: Libraries are critical places for children to learn, and libraries have a long history of delivering information literacy programs for children. Current approaches have focused on workshops, one day events, academic web resources, and teaching strategies for better access and evaluation of information (Polizzi & Taylor, 2019). *The Big Six* is an academic curriculum with instructional materials made for educators to teach about IL skills like conducting research projects, taking notes, and engaging in inquiry processes. IL curriculum like *The Big Six* tend to be top-down approaches in which the librarian or other education professional (e.g. teacher) provides instruction on best strategies to identify and address misinformation, with misinformation examples often taken from contexts that resonate more with adults (Loertscher, 2008). We have few implementation models about how libraries can support children in dealing with misinformation, beyond just telling them to rely on authoritative information resources. We need better strategies that address the real-life interactions of children.

1.4   Need 4: Games and Play-based Learning: There is extensive literature on using games for educational purposes. PI Yip and Co-PI Lee have also developed a digital and physical card game through co-design for

helping teens talk about mental health and well-being around eSports and competitive play (Cho et al., 2022). We believe play-based exploratory activities allow children to experiment safely in a way that currently does not exist. For instance, *Papers Please* is a digital puzzle game set in a fictional world to convey difficult ideas around immigration and border control. Games also enable participants to step into a magic circle that provides permission to play towards mastery, and fail safely, an attribute not present in more conventional forms of misinformation education.

Within this field, there have been multiple experiments on misinformation education using online games. Examples include *Bad News*, *Harmony Square*, and *FakeYou!*. Research on these games show positive outcomes on different dimensions of misinformation awareness and resilience (Chang et al., 2020; Clever et al., 2020; Roozenbeek & Linden, 2020). With funding from IMLS, Co-PIs Coward and Lee have developed a misinformation escape room that leverages the knowledge of librarians to host the game and conduct a post-game discussion with the players to reflect on the game's implications for real life. However, we have little knowledge of play-based learning strategies for misinformation for children ages 6 - 13.

1.5 Need 5: Co-design as a Process to Combat Misinformation: Co-design with adults and children (Yip et al., 2017) has been a process used to create new STEM tools (Ahn et al., 2018; Banerjee et al., 2018), youth mental health innovations (Cho et al., 2022), and other innovative designs. Co-design is a powerful process because of the in-depth insights designers can gain about children and youth (Yip et al., 2017). Currently, only co-PIs Lee and Coward's *Escape Room* project incorporates co-design to deal with the rising tide of misinformation. We argue that this project can teach us how to consider co-design with youth and adults as a design methodology towards combating misinformation.

1.5. Target groups: For this project implementation, we will focus on four specific target groups.

Librarians: We will work with three groups of librarians: The Seattle Public Library (urban), WA or CO libraries(rural), and San Diego Public Library (Latin American majority). We anticipate 2 - 3 librarians per site, for a total of 8 - 10 librarians.
Teens: We will have teen leaders work with librarians to facilitate the co-design sessions. We anticipate two teen leaders per site per year, with 6 teens per year, and 12 teens total for the project.
Children: Based on prior work, each library site will have 10 - 12 children (ages 6 - 13). These children will be the design partners who will co-design the activities. We anticipate 30 - 40 children total in this project.
MLIS students: The UW iSchool will support this project with MLIS students who will work with children to co-design. Based on prior enrollments of PI Yip's participatory design and libraries course, we anticipate 20 - 25 per cohort, with a total of 40 - 50 MLIS students.

1.6 Beneficiaries: The larger beneficiaries around this national project are the following:

Families and children: By developing a series of play-based online activities for children around misinformation, we seek to create ways in which children can understand misinformation and can have conversations with their parents around this important topic.
Public librarians and educators: Librarians and educators will be able to use our materials to 1) work with children on the topic of misinformation; and 2) develop their own lessons and activities around our materials.
Researchers: We seek to advance our knowledge on youth and misinformation with researchers in the field of child-computer interaction, learning sciences, and library and information science.
Designers: We will provide insights on designing play-based activities (including apps) for children.

1.7 How this advances the field/practice of profession and how this work differs: We seek to gain a better understanding of how to help children combat misinformation. Our implementation differs from the status quo in that: (1) we acknowledge librarians, children, and teens as near-peer leaders from an asset-based perspective in that they have ideas and strategies we can leverage through co-design; (2) utilize professional experts and

interdisciplinary advisers in misinformation to support the implementation; (3) create playful digital products that can be integrated into localized activities by educators and librarians; and (4) develop the foundational stepping stone of creating a repository of tools, guidelines, activities, and reports that can later be studied and developed more fully.

2.   Project Work Plan:

2.1   Goals: This project will focus on the following four goals:

Goal 1: Knowledge of children and misinformation: We seek to understand children's experiences, perceptions, and strategies around misinformation. This project will give us the basis for the creation of a white paper report for broader dissemination on children and misinformation.

Goal 2: Product development and implementation: We will develop digital play-based exploratory activities for use by libraries. These activities aim to equip children with experiences and knowledge that will enable them to safely and effectively navigate misinformation. The specific goal is to produce three activities for nationwide distribution. We envision the activities to take the form of *TikTok* scavenger hunts, *Minecraft* misinformation puzzles, escape rooms, and other games.

Goal 3: Co-design Curriculum: We aim to develop a scalable online co-design curriculum for librarians to create their own play-based misinformation activities for children. We further aim to develop this curriculum in such a way as to avoid the political divisiveness of the topic. We want the library programs to be attractive and welcoming to the children of parents of all ideological leanings.

Goal 4: Dissemination of knowledge, products, and curriculum: Finally, we will create a hub for accessing all project resources and undertake a nationwide dissemination campaign with the aim of facilitating broad uptake among libraries. Our field leading [Center for an Informed Public](), partnership with [WebJunction](), and investment in [Loki's Loop](), among other assets, will ensure sustained commitment to supporting libraries to take full advantage of the project's outputs.

2.2   Description of the current work:

KidsTeam UW and KidsTeam Libraries: From 2015 to present, PI Yip has developed a robust on-campus and online intergenerational co-design group between SPL and children co-designers (ages 6 - 11), called *KidsTeam UW.* We have engaged in over 300+ co-design sessions and have created a number of digital learning activities that have been used successfully by youth and family patrons at SPL, industry partners (e.g., Amazon, Duolingo), academic institutions, etc. During COVID-19, KidsTeam UW transitioned the entire team to online (Lee et al., 2021B). We have done KidsTeam UW now for two years successfully online, and plan to transition the group into a hybrid program (both local and online together). From 2017 - 2022, we have developed co-design library partners in Seattle, rural Washington, and San Diego. *KidsTeam Libraries* is a dedicated co-design program to support library partners in the co-design of digital learning activities and programs in neighborhood library branches in urban and rural libraries. While COVID-19 and internet infrastructure posed challenges, we were able to successfully create two co-design teams with the librarians and UW students. We also developed a teen co-design leadership program (Roldan et al., 2022) in which teens learn about co-design and serve as lead facilitators of co-design teams with children.

Center for an Informed Public (CIP): The CIP is a field-leading center for research on mis- and disinformation and translation into policy, technology design, curriculum development, and public engagement. We are the only Knight-funded center with a commitment to libraries, as illustrated by several projects, including: *Co-Designing for Trust: Reimagining Online Information Literacies with Underserved Communities* (NSF); *Researching the changing role of public trust and misinformation in local communities in Whatcom County, Washington* (innovation grant); *Examining the Role of Public Libraries in Combating Misinformation* (innovation grant); *Misinformation Escape Room: Building a research agenda for a gamified approach to combating health misinformation* (UW Population Health Initiative), and; *Misinformation Escape Room: Supporting Libraries as Hubs*

for Misinformation Education (IMLS). Co-PI Coward is a co-founder of CIP, Co-PI Lee is a faculty affiliate, and the Center has numerous other faculty, research scientists and students contributing to the library and other projects.

2.3   Specific activities and sequence: Our process for designing new play-based activities will employ teens (ages 14-17) as leaders of intergenerational co-design teams with children (ages 6 - 13), librarians, and MLIS students. (Lee et al., 2021A; Yip et al., 2020). Our prior work in developing intergenerational co-design groups of children, teens, and librarians has proven effective for developing new digital curriculum (Yip et al., 2020), creating relational bonds between librarians and communities (Yip et al., 2017), and allowing teens to innovate in design (McDevitt, 2021). By having **teens lead co-design groups of children as near-peer leaders**, we can better identify types of misinformation children commonly encounter and develop play-based exploratory activities that support their digital literacy transition towards adolescence. Figure 1 outlines our three year process.
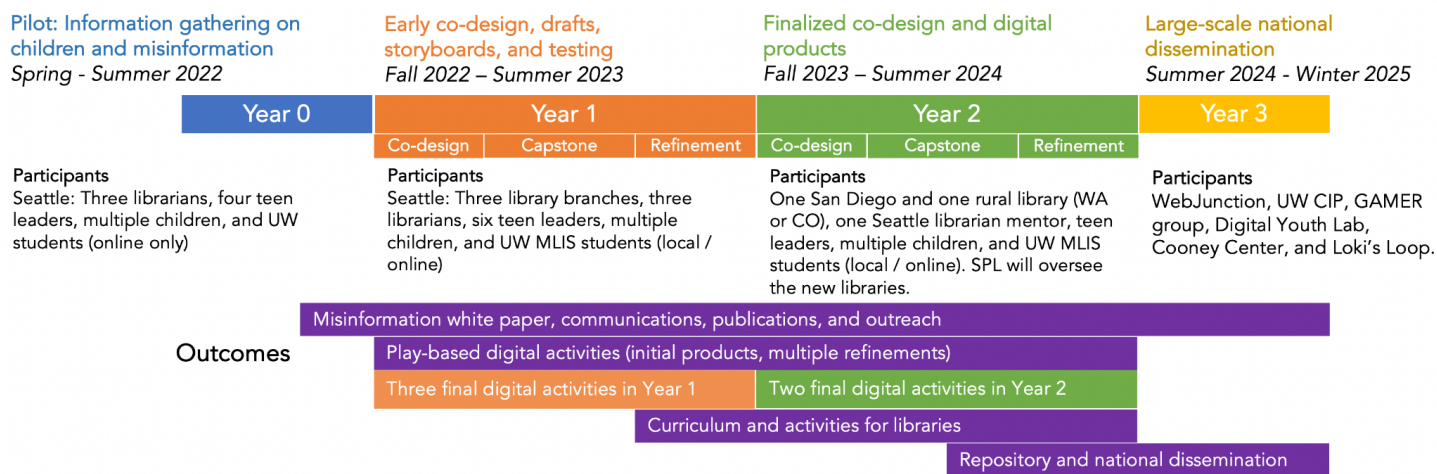

Figure 1. Timeline for our three year process.

2.3.1   *Year 0: Pilot study and information gathering*

Process: In Spring 2022 (April - May 2022), we are leveraging our prior work from *KidsTeam UW*, *KidsTeam Libraries*, and the *Escape Room* project to implement four online co-design sessions for Fall 2022. Led by four teens, three Seattle librarians, and five graduate students in the MLIS program, these co-design sessions seek insights to the following questions: 1) How do children recognize misinformation?; 2) How do children encounter misinformation in different aspects of life (personal life, entertainment, and research)?; 3) How can we leverage digital platforms that children are already actively using (e.g. *Minecraft*) to practice healthy ways of encountering misinformation?; and 4) What's a possible game children want to design to help other children understand misinformation? Please see **Appendix B: Pilot Studies**.

Outcomes: These sessions will provide an initial understanding of how children think about misinformation and what they believe needs to be done about it. We will be able to communicate to other librarians our findings through blogs, webinars, and the first drafts of a white paper report. This also sets us up for the launch of the proposed project in Fall 2022. We will be pilot testing these four co-design sessions in Summer 2022 in KidsTeam UW, with an expected launch in Fall 2022 in KidsTeam Libraries.

2.3.2   *Year 1: Local co-designing, creation, and pilot testing (August 2022 - July 2023)*

Process: Year 1 will be a teen- and librarian-led effort using intergenerational design groups at SPL.

Library Co-design with UW MLIS Class: In Fall 2022, we will use data from Year 0 as the basis to deepen our understanding of children's understanding of misinformation. The work will be situated in three Seattle library sites (Rainier Beach, Columbia City, and Beacon Hill) with a large involvement of BIPOC populations. Juan Rubio, an expert at co-design with seven years of experience working with PI Yip and Co-PI Lee, overseeing the logistics. To continue our high recruitment of children during COVID-19, we will continue using the same model as *KidsTeam Libraries* where we work closely with neighborhood librarians and offer both

in-person and online co-design sessions. Six teens will lead with two librarians the co-design sessions with children at the local libraries. UW MLIS students taking the participatory design and libraries course offered by PI Yip will act as facilitators. Based on prior experience of teaching this class, we anticipate between 20 - 25 MLIS students, with 10 - 12 children per site (approximately 30 children total). The co-design sessions will be held weekly for a total of 8 sessions, each 2 hours in length. All sessions (local / online) will be video recorded for analysis. By the end of Fall 2022 the three teams will have co-created a number of initial designs for play-based misinformation activities. We will select / merge one main idea from each of the three libraries to work on for Winter 2023.

Considering that misinformation has become a divisive and politicized matter, we will also consider ways to build play-based activities that are focused on misinformation without bringing in political issues. For instance, our misinformation escape room *Euphorigen* does this by creating a fictional narrative, rather than focusing on real world actors. We will use co-design to combat bias by incorporating multiple perspectives and working towards the same goal in a respectful way. We may need to develop strategies, such as co-creating support groups for librarians that may be caught with negative repercussions from having incorporated these activities in their politically divided communities.

Capstone (Design and Testing): In Winter 2023 the focus will turn to developing more robust and refined designs. During this time, we will be working with MLIS Capstone students to take data from Fall 2022 to create more refined digital designs for **three digital play-based activities** for testing in Spring 2023. We will deploy and evaluate the designs for children at the above mentioned branches of SPL that serve a primarily BIPOC population. Teens will continue to lead with librarians, and MLIS Capstone students will remain involved. Depending on the COVID-19 situation, the tests will occur in local workshops or in online settings. For either local/online workshops, librarians and teens will together run trial activities with our designs, while MLIS Capstone students will facilitate and researchers will collect usability testing data. For instance, we have multiple co-design techniques, such as Likes, Dislikes, and Design Ideas (Walsh et al., 2013) that can be used to evaluate designs.

Refinement: In Summer 2023, we will take the data from Fall 2022 to Spring 2023 to create the final three digital play-based designs. We will also start working on the curriculum that will be associated with the final Year 1 designs. New teen leaders will also be integrated into the project and trained for the Summer 2023 expansion. With this mix of new and returning teens, we will be able to keep refining the designs. UW MLIS students will still be strongly involved as facilitators.

Outcomes: In Year 1 we will: (1) run 24 co-design sessions across three Seattle libraries; (2) produce multiple early draft designs; (3) conduct pilot tests of 3 main designs with around 30 children in Seattle branches; (4) refine the main designs from Year 1 testing; and (5) generate insights for refining the co-design curriculum.

2.3.3 *Year 2: Expansion of co-design and testing (August 2023 - July 2024)*

Process: In Year 2 we will work with two new online library partners. Because of time zone differences, and using hybrid local/online synchronous co-design, we are focusing on the West Coast: one in San Diego and one a rural library in WA or CO. We have worked with San Diego Public Libraries with larger Latino populations from our prior IMLS work. One of the branches from Seattle Public Libraries will oversee the new libraries. We will continue to use our partnership with the UW iSchool MLIS program to have graduate students act as facilitators in the participatory design and libraries course taught by PI Yip.

Library Co-design with UW MLIS Class: In Fall 2023 we take the co-designed digital activities from Year 1 and introduce them to the library sites for some quick evaluations. We hope to use the Year 1 designs to inspire new designs for Year 2. Over this period each library will run 8 co-design sessions, involving 20 - 30 children. Teens will co-lead with librarians in San Diego and the rural site. We will further involve University of Maryland (urban co-design) and Boise State University (rural co-design) as advisors, groups we have worked

with on prior projects (see Section 2.4). UW MLIS students will work online with San Diego and rural libraries to facilitate the co-design sessions. We expect each library to produce about 2 initial design ideas per library for Year 2 (four total ideas).

Capstone (Design and Testing): In Winter 2024, we will revise the Fall 2023 designs. MLIS Capstone students will take the data from Fall 2023 to create more refined digital designs, resulting in two more digital play-based activities for Year 2. In Spring 2024, the MLIS Capstone group, together with the teen leaders and librarians, will test the design in San Diego libraries and the rural library site. We will also try the new designs out in Seattle Public Libraries. MLIS students will then take the final set of more refined designs and turn them into fully functional products as part of their Capstone projects. Throughout Year 2 we will also be making refinements to the curriculum by continuously analyzing Year 1 testing data and incorporating the feedback into Year 2 curriculum. Librarians and our advisory board will be frequently consulted for these refinements.

Refinement: In Summer 2024, we will create the final two digital play-based designs, for a total of five digital activities (three from Year 1, two from Year 2). We will work with the teen leaders to finalize the curriculum associated with Year 2 designs.

*Outcomes***:** By the end of Year 2 we will: (1) run 16 co-design sessions across two libraries (one San Diego, one in rural WA/CO); (2) produce a final set of 2 new misinformation play-based designs; (3) test these activities in these two sites; and (4) develop 2 final products from Year 2; and (5) refine and finalize the co-design curriculum.

2.3.4 *Year 3: Large-scale dissemination campaign (August 2024 - February 2025)*

Process: In Summer 2024 we will work with our communications team to (1) package the activities and curriculum, (2) produce accompanying training and implementation resources; (3) create an online hub on Loki's Loop for accessing all resources; and (4) develop a communications strategy with [WebJunction](#) for reaching libraries nationwide, including a communications kit with video clips of different lengths for distribution via social media, infographics, and other visually appealing artifacts. WebJunction's expertise and extensive reach will allow us to disseminate our work through articles in Crossroads articles, Webinars, workshops at PLA Conference, and promotion through social media channels. One critical component of the resources will be discussion guides for each activity. The opportunity to reflect on a game and consider its real life implications is when most learning happens. Another important resource will be a collection of misinformation examples that are relevant to the youth, along with digital cards or infographics to explain the different types of misinformation and how they work. We will also have a co-design process toolkit for misinformation. This guide will help librarians design their own misinformation play-based resources through co-design processes. We will also be finalizing our white paper report for distribution that tackle strategies that librarians and families can take on to combat misinformation from our co-design perspective. From Fall 2024 to Winter 2025 we will conduct our large-scale dissemination campaign. In addition to WebJunction we will leverage UW Information School channels ([CIP](#), [GAMER Group](#), [Digital Youth lab](#)) and external partners ([Young Adult Library Services Association](#), the [Joan Ganz Cooney Center (Sesame Workshop)](#). In disseminating the curriculum we will encourage libraries to upload the play activities they designed onto our website ([Loki's Loop](#)) for further reach. Lastly, we will finalize the whitepaper and disseminate broadly as well.

Outcomes: By the end of Year 3 (6 months) we will: (1) package the final set of 5 play-based activities and accompanying resources; (2) develop a hub for accessing the activities and contributing new ones; (3) conduct an extensive dissemination strategy; and (4) broadly disseminate a whitepaper report on our process and outcomes.

2.4 Planning, execution, and management of project:

Project Staff: Dr. [Jason Yip](#) is the PI of the project. He will teach the participatory design and libraries course associated with this project, manage the co-design sessions, and support the design, implementation,

and dissemination of the digital play activities. Co-PIs Dr. Jin Ha Lee and Chris Coward will lead efforts in the co-design and the national dissemination of the digital play-based activities. Doctoral student Ziyue Li will help implement the project. Juan Rubio, the Digital Program Manager at The Seattle Public Library will support coordination of librarians. Dr. Lindsay Morse will support the design and development of digital puzzle and game elements in Years 1 - 2. The core leadership will have regular bi-weekly meetings among the staff and project partners (e.g., librarians, teen leaders, UW students, dissemination partners). These meetings will look at the week-by-week sub-goals that need to be achieved. We will have four quarterly review meetings with PI, co-PIs, and project partners.

Advisory board: To provide us with advice, we have recruited a number of accomplished scholars, community members, and designers as **advisory board members**. They will include Dr. Tamara Clegg (play-based learning), Cindy Aden (former WA state librarian), Dr. Elizabeth Bonsignore (urban co-design, digital games), Dr. Jerry Fails (rural co-design), and Drs. Jevin West and Emma Spiro (misinformation, CIP), Dr. Michael Preston (Joan Ganz Cooney Center at Sesame Workshop, families and technologies), Lisa Castenada (Foundry10, youth programming and technology learning), Dr. Michelle Martin (UW MLIS, youth information literacy). We will convene the advisory board twice-a-year to share progress and obtain feedback. We will also be demonstrating our designs, and draft and final activities. They will also provide feedback on the whitepaper report. Please see **Appendix A: Letters of Support** for more details.

**3.	Diversity Plan:**

This project is committed to selecting half of the participating libraries and youth from communities with significant rural, historically marginalized, or lower-income populations. We will also ensure that diversity is one of our guiding principles as we create the experience (e.g., diverse representation of names, persons, cultural elements). We will work with local librarians who have gained the trust of the neighborhood. All of the libraries we have worked with in the past were recruited because they all had trustworthy access to diverse children. For instance, we have worked with prior librarians in our IMLS project to reach out to cultural groups, neighborhood schools, religious groups, The Boys and Girls Club, etc. to recruit local children. To diversify and our project sites include:

- The Seattle Public Library (SPL): SPL has a mission of serving its patrons through a lens of social justice (e.g., equity work, BIPOC, immigration, LGBTQ+, supporting lower-SES patrons, etc.). We are working closely with Juan Rubio (digital program manager)

- Rural libraries: We will continue to work with established rural library partners in WA and CO state, with families with incomes below the state median. We seek to serve families in rural areas that are lower-SES, lower home broadband access, and need support with digital resources (Swan et al., 2013).

- San Diego Public Libraries (SDPL): We have worked with SDPL, who serve immigrants in the Latino community through the IMLS-supported project from 2018 - 2022. We have been working with Oceanview and Escondido Library, which serves a population that is 20% born outside of the USA.

To include a diversity of perspectives, we will employ co-design techniques and that will be carefully selected (Yip et al., 2017). First, we will utilize Cooperative Inquiry, a framing of adults and children as design partners seeking to build relationships, co-facilitate, design together, and idea together (Yip et al., 2017). Design partnerships sets up the base foundation of the collaborations with the community. The philosophy of co-design through design partnerships integrates inclusion, equity, and diversity in its core (Yip et al., 2017). We focus on equality in co-design as providing people the same opportunities to contribute to idea generation, design, and decision-making practices. Similarly, equity in co-design emphasizes how people in power can allocate resources and commit effort to helping people overcome obstacles to find fairness and success in design. With equality and equity for co-design in-mind, we will provide a variety of ways for participants to input their feedback, regardless of their background, levels of literacy, etc. (Harrington et al., 2019). For instance, PI Yip developed a co-design techniques framework (Walsh et al., 2013) that takes into account diverse literacies, non-

technology resources, and multiple modalities (e.g., drawing, writing, building, acting, etc) to support many ways that children can provide their input.

Similarly, PI Yip and Co-PI Lee's work with Lee et al. (2021B) approaches co-designing with children online as improvisation and games. This perspective allows us to be careful with the accessibility of technological tools. We are not a formal school setting, which can often be authoritative and seek specific answers (e.g., standardized testing). Instead, co-design processes with us are informal activities in libraries that we will emphasize improvisational play to engage children to speak up. Our process of seeking designs without specific direct answers allows children to open up more, which can support how to integrate a diversity of perspectives. Our co-design process has successfully generated many ways in libraries and children's perspectives can be integrated well into design. Our process focuses on teens participation and teen leadership as a catalyst for defining the challenges and opportunities of our designs. We worked together with two BIPOC teenagers who led the design and implementation of a 3D printing curriculum in their local library with 10 children (Roldan et al., 2022). The teen leads noticed, enforced, and disrupted power within our computing education program. We will be utilizing this same model of teen leadership for all of our co-design sessions throughout the project to support diversity of perspectives.

Misinformation is a topic that has little information about how BIPOC people are affected. We know children are being targeted by misinformation (see Section 1.1), however, we do not know the extent to which diversity plays a role in all this. We do not know how specific groups of children (e.g., BIPOC, rural, lower-SES, immigrants, etc) react and deal with misinformation. By being able to create digital projects that have been co-designed with many different perspectives, we will be able to implement strategies that take into account the nuances and subtleties that take into account diversity and equity.

4. Project Results:

4.1 Results: We have the following intended results that address the need for our work.

Result 1: The first result will be the **information dissemination** around the topic of misinformation, children, and libraries.

- *Knowledge advancement*: We plan to develop a white paper report similar to UNICEF (2021) that outlines all the lessons we have learned in our Year 0, 1, 2, and 3 project. This white paper will focus on lessons on misinformation through this community project implementation. Nationally, there is a major dearth of knowledge and understanding on misinformation and children.
- *Benefits to society:* We recognize the difficulty in the politicized nature of communities that have people with conflicting perspectives. For this reason, we seek to develop case studies and examples from our co-design and implementation to help librarians navigate these controversies with families and children. Through this national project, in urban and rural libraries, our white paper can be useful for policy makers, researchers, designers, and educators on misinformation and youth.

Result 2: The second result will be the **initial collection** of five play-based digital artifacts, curriculum, and programs, designed with connected learning principles (Hoffman et al., 2016), that equip children with the knowledge and skills to build resilience to misinformation. We will also provide a modular set of digital curriculum and materials around these five activities for libraries developed by librarians, teen-leaders, children, and MLIS students across the nation.

- *Knowledge advancement:* We will provide lessons and design guidelines on the opportunities and challenges of how play-based digital artifacts and activities can support strategies to mitigate misinformation.
- *Benefits to society:* A collection of digital resources that have been carefully co-designed by children, teens, researchers, designers, and libraries will be able to fill a needed gap to support educators' need for high-quality resources on using information literacy (IL) strategies to deal with misinformation.

Result 3: We will **create a co-design curriculum** that allows librarians to create their own digital explorations and activities. Project funding from IMLS will allow us to incorporate findings from our 2017 - 2022

co-design with librarians with our work in misinformation to develop a fully online digital curriculum and set of activities libraries can utilize with children.

- *Knowledge advancement:* We will be able to learn more about what processes are effective or not effective in helping librarians create their own activities around misinformation for children.
- *Benefits to society:* We seek to create co-design models (e.g., hybrid workshops (local / online), communities of librarians) and ways to support youth communities to get involved in supporting librarians' design to support librarians to run their own future online co-design teams.

Result 4: The national dissemination of our digital play-based activities, report, and guidelines will be the final result of this project. We plan to use data analytics (e.g., log files, download counts) and qualitative research later to examine how our materials are being integrated and used.

- *Knowledge advancement:* Our dissemination will help us understand what makes a set of activities and guidelines "sticky", that is, what are the features of our dissemination that facilitate uptake by librarians and educators.
- *Benefits to society:* A free, accessible set of white papers, digital activities, guidelines, and models will allow educators to make their own decisions about how best to support their local communities.

4.2   Ensuring project deliverables are readily adaptable, generalizable, usable, and sustainable: We are seeking to develop a collection of online resources that will be foundational to future development of a larger collection. For example, PhET Interactive Simulations (https://phet.colorado.edu) are a collection of physics, chemistry, math, and earth science online simulations that allow explorations and science inquiry that have been accessed by millions of people. Like PhET, we will provide a suite of different digital activities around misinformation that are exploratory, online, and play-based for librarians and educators. Librarians and educators can pick and choose what digital activities work best and supplement these activities with their own lessons, demonstrations, or exploration activities. This will allow adaptability and generalizability to different communities nationally. Please see **Appendix C: Website Prototype With Annotations** as our example. We are also creating webinars, videos, and other support materials to help librarians integrate these activities into their communities. In the future, we will add more play-based digital online explorations around the topic of misinformation that have been co-designed and curated specifically for children. We are addressing the need for more online resources that allow children and learners to explore the topic of misinformation safely.

4.3   Sustain the benefit(s) of your project beyond the conclusion of the period of performance: After the project period is complete, we will still be distributing the materials, white paper, and guidelines through channels at the UW. The UW CIP will be supporting these materials beyond the project period. This project will also be the foundation for the creation of new research. The creation of these materials is the start of a larger repository that the UW Digital Youth Lab can study to better understand what makes effective digital tools for misinformation for children and how best to integrate them into educational settings. PI Yip is also a senior research fellow at the Joan Ganz Cooney Center at Sesame Workshop and will work closely with Michael Preston (adviser) on how these designs can be utilized in family-based settings with children.

Schedule of Completion

	Year 0: January - August 2022				Year 1: August 2022 - July 2023				Year 2: August 2023 - July 2024				Year 3: August 2024 - July 2025			
	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum	Fall	Win	Spr	Sum
Year 0: Pilot study and information gathering		X	X	X												
Year 1: Library Co-design with UW MLIS Class in Seattle					X											
Year 1: Capstone - Consolidate Fall 2022 data and create three refined play-based activities						X										
Year 1: Capstone - Testing three play-based activities in different libraries							X									
Year 1: Refinement - Finalize design of three play-based activities								X								
Year 2: Library Co-design with UW MLIS Class in San Diego and rural Libraries									X							
Year 2: Capstone - Consolidate Fall 2023 data and create two more refined play-based activities										X						
Year 2: Capstone - Testing two play-based activities in different libraries											X					
Year 2: Refinement - Finalize design of two play-based activities												X				
Year 3: Build repository for national dissemination												X	X	X		
Work with collaborators to disseminate the materials and activities.													X	X		
Create misinformation and youth report, communications, publications, and outreach						X	X	X	X	X	X	X	X	X	X	X
Create curriculum and activities for libraries								X	X	X	X	X				

Digital Products Plan

Type: What digital products will you create?

We are creating four types of digital products for distribution:

- A misinformation white paper report that will tackle strategies that librarians and families can take on to combat misinformation from our co-design perspective;

- A set of five innovative online play-based digital activities for children around combating misinformation in libraries;

- A scalable online co-design curriculum for librarians to create their own play-based misinformation activities for children; and

- A website repository hub through Loki's Loop for accessing all project resources (reports, blogs, papers, play-based digital activities, curriculum, etc.)

Availability: How will you make your digital products openly available as appropriate?

All of our project outcomes will be freely available via project website under a Creative Commons Attribution 3.0 - Noncommercial U.S. License. We will make preprints of our journal and conference articles available via ResearchWorks, University of Washington's digital repository based on DSpace. With proper attribution, anyone will be able to use, redistribute, as well as modify instructional materials. All the project outcomes will be accessible with standard web browsers.

In Summer 2024 we will work with our communications team to (1) package the activities and curriculum, (2) produce accompanying training and implementation resources; (3) create an online hub on Loki's Loop for accessing all resources; and (4) develop a communications strategy with WebJunction for reaching libraries nationwide, including a communications kit with video clips of different lengths for distribution via social media, infographics, and other visually appealing artifacts.

WebJunction's expertise and extensive reach will allow us to disseminate our work through articles in Crossroads articles, Webinars, workshops at PLA Conference, and promotion through social media channels. In addition to WebJunction we will leverage UW Information School channels (CIP, GAMER Group, Digital Youth lab) and external partners (Young Adult Library Services Association, the Joan Ganz Cooney Center (Sesame Workshop). In disseminating the curriculum we will encourage libraries to upload the play activities they designed onto our website (Loki's Loop) for further reach. Lastly, we will finalize the whitepaper and disseminate broadly through our open online website. All of our digital materials will be freely accessible and available for use to any youth, librarians, educators, and designers that have a vested interest in misinformation.

Access: What rights will you assert over your digital products, and what limitations, if any, will you place on their use? Will your products implicate privacy concerns or cultural sensitivities, and if so, how will you address them?

The intellectual property status of the digital products we intend to create (e.g., guidelines, reports, digital learning activities) will be licensed under a Creative Commons Attribution 3.0 - Noncommercial U.S. License. We will explain to potential users that they are free to share any reports, guidelines, curriculum, and digital learning activities as long as they attribute the source. With proper attribution, they can copy and redistribute the material in any medium or format. They are also allowed to adapt, remix, transform, and build upon the

material for any purpose, even commercially. We have chosen this form of intellectual property status because we want different libraries, MLIS programs, and designers to use our materials and adapt them to their local contexts. However, we believe that attribution to institutions and designers should be given to properly credit them for their work, and also inform the people using the materials whom they can contact for questions and suggestions.

The ownership rights our organization will assert over new digital products will focus on attribution and appropriate credit. Our digital products will be for open access; we only need appropriate credit. We will notify potential users about relevant terms or conditions by placing a human-readable summary of the Creative Commons Attribution 3.0 U.S. license in our materials.

Because our work involves children, we will take extra precautions to ensure safety and privacy. First, for any materials involving children's names, we will only refer to them through pseudonyms and generic demographics (e.g., age, gender, ethnic background). For any publications involving children's faces (e.g., videos), we will either digitally blur children's faces, select photos that do not show their faces, or we will obtain consent and assent from parents and children for their usage.

Sustainability: How will you address the sustainability of your digital products?

After the project period is complete, we will still be distributing the materials, white paper, and guidelines through channels at the UW. The UW CIP will be supporting these materials beyond the project period. This project will also be the foundation for the creation of new research. The creation of these materials is the start of a larger repository that the UW Digital Youth Lab can study to better understand what makes effective digital tools for misinformation for children and how best to integrate them into educational settings. PI Yip is also a senior research fellow at the Joan Ganz Cooney Center at Sesame Workshop and will work closely with Michael Preston (adviser) on how these designs can be utilized in family-based settings with children.

Data Management Plan

Identify the type(s) and estimated amount of data you plan to collect or generate, and the purpose or intended use(s) to which you expect them to be put. Describe the method(s) you will use, the proposed scope and scale, and the approximate dates or intervals at which you will collect or generate data.

Four types of data will be collected in this project (1) audio, video, and photographic recordings of participatory design workshops; (2) design artifacts, design prototypes, mockups, drafts, field notes, recordings, and other work-in-progress produced by the research and design team in participatory design workshops; (3) interview / survey data of participants; and (4) log data and analytics from usability studies and the website repository. Interview data and pertinent recordings of group interactions will be digitally transcribed. Field notes will be recorded in notebooks and scanned into digital form. Mapping data will be recorded on paper and scanned into digital form. In Years 1 - 2 (co-design, capstone, refinement), we plan to collect mostly data (1), (2), (3), and (4). For Year 3 (dissemination), we will focus most on daa (3) and (4).

Data and Metadata Standards

Qualitative data described in (1), such as interview transcripts, will be stored as individual text files. Quantitative datasets from surveys will be stored as CSV files. Data posted the newly designed apps will be stored and backed up in a relational database. Video and audio will be stored using MPEG H.264 standards. Publications and curriculum materials will be stored in PDF format.

What technical (hardware and/or software) requirements or dependencies would be necessary for understanding retrieving, displaying, processing, or otherwise reusing the data? How can these tools be accessed (e.g., open-source and freely available, commercially available, available from your research team)?

All the hardware and software necessary for this research are provided by the University of Washington Information School. The Project Director (PD) and the research assistant will be using workstations provided by the UW Information School. We will use Dedoose for coding most of our data including videos, audio recordings, and transcripts. We will use Onedrive to save and share any project data among the research team members to meet the FERPA requirements.

Will you collect any sensitive information?

The human subjects data above will comply with the University of Washington's requirements regarding human subjects research activities and privacy. Such data will be stored on UW's *OneDrive* and/or *Google Drive*, both of which are both HIPAA and FERPA compliant. Any information that is obtained in connection with this study and that can result in the identification of participants will remain confidential and will be disclosed only with a participant's permission or as required by law. Participants will be assigned identifier numbers and these numbers will be used in lieu of their names in interview recordings and transcriptions, surveys, and any publications in order to protect their confidentiality. Any potential loss of confidentiality will be minimized by storing all data in a secured, password-protected location.

Data will be collected with the informed consent of participants. The consent form will also encourage participants not to share personally identifying information, such as addresses, phone numbers, or direct contact information within the software they use as part of the research.

What documentation (e.g., consent agreements, data documentation, codebooks, metadata, and analytical and procedural information) will you capture or create along with the data? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the data it describes to enable future reuse?

We expect many of our assets, such as open-source code for the newly designed apps, lesson plans, and other materials to be reused, remixed, or otherwise modified, provided that attribution is retained typical of open

source licenses. Project results, software, and curriculum materials will be archived on a University of Washington web server, managed by UW-IT as part of the university's centrally managed computing infrastructure, for permanent availability to the public. All records intended for sharing will be assigned a permanent URL to support reuse and citation. A project website will be automatically indexed in Google and Google Scholar to help the data reach a wider audience. Members outside of the research team will not have access to any private, identifiable data collected as part of research, unless they have expressed permission by the research team, agree to the University of Washington's IRB requirements, and have been formally added to the IRB of the project.

What is your plan for managing, disseminating, and preserving data after the completion of the award-funded project? If relevant, identify the repository where you will deposit your data. When and for how long will data be made available to other users?

We will promptly prepare and submit for publication, with authorship that accurately reflects the contributions of those involved, all significant findings from work performed in this project. To promote widespread use and dissemination of our research results, all of our work will be published and presented openly at research venues, including both conference and journal publications in the computing, information science, and medical fields. We expect to publish the results in computing-oriented venues such as *ACM's CHI, Interaction Design & Children, Designing Interactive Systems*, and *CSCW* conferences, as well as journals relevant to the domain of learning sciences such as *Computer Supported Collaborative Learning* or the *International Conference of the Learning Sciences*, and library and information sciences.

In Year 3, we will work with our communications team to (1) package the activities and curriculum, (2) produce accompanying training and implementation resources; (3) create an online hub on Loki's Loop for accessing all resources; and (4) develop a communications strategy with WebJunction for reaching libraries nationwide, including a communications kit with video clips of different lengths for distribution via social media, infographics, and other visually appealing artifacts. WebJunction's expertise and extensive reach will allow us to disseminate our work through articles in Crossroads articles, Webinars, workshops at PLA Conference, and promotion through social media channels.

We will conduct our large-scale dissemination campaign. In addition to WebJunction we will leverage UW Information School channels (CIP, GAMER Group, Digital Youth lab) and external partners (Young Adult Library Services Association, the Joan Ganz Cooney Center (Sesame Workshop). In disseminating the curriculum we will encourage libraries to upload the play activities they designed onto our website (Loki's Loop) for further reach. Lastly, we will finalize the whitepaper and disseminate broadly as well.

Applications we develop that are useful to schools and families will be made publicly available for free use by educators, designers, and other research teams by making them publicly available on our website repository, which will be hosted at the University of Washington.

All data gathered as part of the project will be archived on the University of Washington's *OneDrive* and/or *Google Drive* storage for at least 5 years beyond the project duration, except data that must be discarded due to Human Subjects requirements.

When and how frequently will you review your Data Management Plan? How will the implementation be monitored?

We will be reviewing our Data Management Plan three times a year, at the beginning, middle, and end of Years 1, 2, and 3. The implementation will be monitored by the PI and Co-PI through weekly meetings to consider 1) what data we need to collect; 2) what data needs to be analyzed; 3) what data has been collected already; and 4) who will have access to that data and for how long..

The Information School at the University of Washington

Mission

Our Passion. We are inspired by information. We want everyone to know how vital information is in all aspects of life. *Our Vision*. We envision a world where effective use of information helps everyone discover, learn, innovate, solve problems and have fun. We envision a world free of existential problems. Information changes lives. *Our Mission*. We make information work. We prepare information leaders. We research the problems and opportunities of information. We design solutions to information challenges.

- Source: https://ischool.uw.edu/about/mission-vision, Adopted by the Dean most recently in 2021 after consultation with faculty, staff, student and external advisory boards and councils.

Governance Structure

The Information School is one of 18 independent schools and colleges comprising the University of Washington, a Tier 1 public research university ranked by Reuters as one of the top five most innovative public universities in the world in 2019. Study at the iSchool is guided by the Dean, who reports to the Provost. The iSchool currently consists of 70 faculty members of diverse expertise, with backgrounds ranging from the library and computer sciences to education, business, philosophy, and sociology.

Service Area

The UW iSchool serves the people of the state of Washington.

Brief History

Founded in 1911, the library school at the University of Washington was established as a response to the growing need, in the Western United States, for highly trained, well-prepared librarians. Over the course of the next 90 years, the school continued to play an essential role in the field of librarianship in the Northwest, as the school gained a reputation for producing extremely strong library professionals. Beginning in 2000, in response to changes in the ways people create, store, find, manipulate and share information, the school introduced a variety of new continuing education certificate programs and new degree programs, including the Online Master of Library and Information Science, the Bachelor of Science in Informatics, the Ph.D. in Information Science and the Master of Science in Information Management. In 2001, the Information School became the newest independent school of the UW, known simply as the Information School, or the iSchool, for short.

In the most recent U.S. News and World Report rankings (2021) of Library and Information Science programs, the UW iSchool is ranked second overall in the nation; second for digital librarianship and for information systems; third in health librarianship; fifth in services for children and youth; and eleventh in school library media. As a leading member of the iSchool movement, the UW is a model for other information schools around the world. The iSchool offers four degree-granting programs. The flagship program, the ALA-accredited Master of Science in Library and Information Science (MLIS), the oldest such program west of the Mississippi River. The iSchool also offers a Bachelor of Science in Informatics, Master of Science in Information Management (MSIM), and PhD in Information Science.