



Research paper

Teachers using technology for co-teaching and crowdsourcing: The case of Global Read Aloud collaboration

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H I G H L I G H T S

- Teachers collaborate in the planning and teaching of the Global Read Aloud (GRA).
- Teachers self-reported their collaboration experiences in this grassroots project.
- Primarily qualitative data from surveys ($N=436$) and interviews ($N=21$) were analyzed.
- Various forms of co-teaching and crowdsourcing featured in GRA collaboration.
- Time and follow-through related challenges complicated collaboration efforts.

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A B S T R A C T

Information and communication technologies (ICT) have increased opportunities for potentially beneficial teacher collaboration across schools. One manifestation of this can be found in the Global Read Aloud (GRA), a grassroots literacy project in which teachers and students from various schools, regions, and countries use ICT to connect around common readings. This research used surveys ($N = 436$) and interviews ($N = 21$) to explore the teacher collaboration associated with the GRA. We found that GRA collaboration involved crowdsourcing and co-teaching of various degrees of depth. Participants benefited from access to resources and like-minded educators, and were challenged by logistical and internal barriers.

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1. Introduction

Collaboration among teachers has long been cast as a desirable professional activity (Brownell et al., 1997; García-Martínez et al., 2020; Härkki et al., 2021). Teachers can share ideas and emotional support, co-create materials, and engage in co-teaching. Such potential benefits have resulted in substantial advocacy for increasing teacher collaboration opportunities (Reeves et al., 2017). Historically, collaboration most commonly has occurred among geographically proximal teachers. Such teacher collaboration takes many forms, ranging from co-teaching to casual faculty-lounge idea

swapping, to professional learning community activities (de Jong et al., 2019; Vescio et al., 2008). Collaboration among school colleagues can lead to greater collective belief that their institution can achieve its goals, and this collective teacher efficacy has in turn been linked to student achievement (Goddard et al., 2004; Moolenaar et al., 2012).

Local collaboration continues to play a crucial role in school improvement efforts, but information and communication technologies (ICT) have helped mitigate spatial constraints on collaboration. As a result, many teachers have opportunities to connect in new ways and with colleagues from beyond their schools (Carpenter & Green, 2017; van Bommel et al., 2020). Indeed, the COVID-19 pandemic forced many teachers to engage with technology in new ways, and teacher collaboration via ICT may increase in the future, underscoring the strong need for insights into teachers' virtual collaborations. However, the research that

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explores new forms of technology-mediated educator collaboration is still developing (Carpenter & Harvey, 2020). Studies have explored teacher collaboration via technology in courses, programs, and formally organized communities (Lantz-Andersson et al., 2018), but ICT also support more grassroots collaboration (Smith Risser, 2013), and self-initiated teacher collaboration with technology has received limited attention. Additionally, the research that has addressed self-initiated teacher collaboration via technology has attended primarily to the resulting professional learning (e.g., Beach, 2017; García-Martínez et al., 2020).

This paper presents an empirical study of how teachers use ICT to collaborate in a free, grassroots project called the Global Read Aloud (GRA). To date, there has been only limited research on the GRA (Carpenter & Justice, 2017a, 2017b; Kerkhoff et al., 2021), none of which focused on teacher collaboration. GRA teacher collaboration offers a novel case that is worthy of exploration. Unlike more open-ended collaborative activities, the GRA is a specific teaching and learning project. Research suggests that a strong link to practice can enhance teacher collaboration (Meirink et al., 2010; Supovitz, 2002), and the GRA presents an example of collaboration with technology that is directly connected to practice. In this paper, our purpose is therefore to explore the opportunities and challenges associated with the teacher collaboration via technology that occurs in the GRA. In doing so, we seek to contribute to broadened understandings of two forms of collaboration in education: co-teaching and crowdsourcing.

1.1. What is the Global Read Aloud

The GRA started in June of 2010, born out of the creativity of United States (U.S.) teacher Pernille Ripp. Inspired by a radio story about online book clubs, Ripp sought to organize teachers in the coordinated reading of texts across their various classrooms. In the ensuing years, the GRA has reportedly included more than 2,000,000 student participants (see Ripp, n.d.). The project begins with Ripp selecting the books for the read aloud. She makes selections for various ages, including an author study with several picture books for the youngest grades, and novels for higher grades (Table 1). Then, starting in October each year, teachers read the selected texts with their students over a six-week period. Educators who are interested in joining the GRA register via an online form on Ripp's website. Participants then receive email updates before and during their GRA participation. Educators are encouraged to join GRA social media spaces (e.g., Facebook groups), where they can find other participants with whom to connect. Rough guidelines and reading schedules are also provided. Teachers can collaborate inside and outside their schools through digital tools and ask students in their classes to collaborate, learning together while

reading the same book (Carpenter & Justice, 2017a). Teachers connect via ICT such as Twitter, Padlet, Zoom, or Flipgrid to plan, share resources, or synchronize lessons (Carpenter & Justice, 2017a; 2017b). Given the diversity of technologies used in the GRA, we use the umbrella ICT term to include all communication technologies such as the internet, apps, social media, software, and video-conferencing that enable users to access, create, manage, and transmit information in the digital world (see International ICT Literacy Panel, 2002).

GRA participation is generally voluntary, and teachers have substantial autonomy in its execution. The number of connections with other teachers, and the scope and depth of the project are determined by the teachers themselves. The GRA may encourage teachers to create and facilitate innovative collaboration and exchanges between classrooms in the USA and with peers worldwide. These exchanges can contribute to the development of global readiness by promoting awareness, understanding, and appreciation across cultures, customs, and traditions. Carpenter and Justice (2017a) reported generally positive perceptions of the GRA among a sample of teachers (N = 516). Participants indicated that technology facilitated collaboration among partner teachers, but collaboration was not a primary focus of that broad, exploratory study, and this research therefore builds upon earlier findings through a dedicated analysis of GRA teacher collaboration via technology.

2. Conceptual framework

Teacher collaboration has been conceptualized in various ways, but in this paper, we broadly define collaboration as teachers' cooperative actions for job-related purposes (Kelchtermans, 2006). Our understanding of the technology-mediated collaboration in the GRA was framed by two concepts related to teacher collaboration: co-teaching and crowdsourcing.

2.1. Co-teaching

The co-teaching concept originated in special education to describe a general education and a special education teacher jointly delivering instruction (Friend et al., 2010), while the related team teaching term is commonly associated with the middle grades and collaboration among general education teachers with distinct areas of expertise. For example, teachers can co-teach integrated science, technology, engineering, arts, and math (STEAM) activities (Wu et al., 2021). Some teacher education programs also use co-teaching student teaching models (Baeten & Simons, 2014; Guise et al., 2017). We use the co-teaching term in this paper with it understood to include any joint planning for and delivery of instruction (see Rytivaara et al., 2019). GRA teachers typically partner with

Table 1
Recent GRA book selections by year and grade level.

Year	Author Study of Picture Books	Early Readers	Upper Elementary/Middle Grade	Middle School/Intermediate	Young Adult
2016	Lauren Castillo	<i>The BFG</i> by Roald Dahl	<i>Pax</i> by Sara Pennypacker	<i>Orbiting Jupiter</i> by Gary D Schmidt	<i>All American Boys</i> by Brendan Kiely and Jason Reynolds
2017	Mem Fox	<i>Fenway and Hattie</i>	<i>The Wild Robot</i> by Peter Brown	<i>A Long Walk to Water</i> by Linda Sue Park	<i>A Monster Calls</i> by Patrick Ness
2018	Julie Flett and Monique Gray Smith	<i>A Boy Called Bat</i> by Elana K. Arnold	<i>Amal Unbound</i> by Aisha Saeed	<i>Refugee</i> by Alan Gratz	<i>Love, Hate and Other Filters</i> by Samira Ahmed
2019	Yuyi Morales	<i>Stela Diaz Has Something to Say</i> by Angela Dominguez	<i>Front Desk</i> by Kelly Yang	<i>The Bridge Home</i> by Padma Venkatraman	<i>The Marrow Thieves</i> by Cherie Dimaline
2020	Juana Martinez-Neal	<i>Planet Omar: Accidental Trouble Magnet</i> by Zanib Mian, illustrations by Nasaya Mafaridik	<i>Indian No More</i> by Charlene Willing McManis and Traci Sorrell	<i>Prairie Lotus</i> by Linda Sue Park	<i>Stamped: Racism, Antiracism, and you</i> by Jason Reynolds and Ibram X. Kendi

one or more other educators in order to engage in some degree of co-teaching.

Co-teaching reflects the possibilities and complexity associated with collaboration. Teachers who jointly deliver instruction can employ strategies that leverage their combined experiences, expertise, and presence, and may be more capable of responding to students' myriad needs and interests (Jurkowski & Müller, 2018). Co-teaching ideally combines "teachers' unique perspectives and strengths together to create teaching approaches that would not otherwise actualise" (Härkki et al., 2021, p. 2). Despite co-teaching's intuitive appeal, challenges can occur during planning and implementation (Friend et al., 2010; Hilli, 2020; Jurkowski & Müller, 2018; Mastropieri et al., 2005). To co-teach effectively, teachers often need support in terms of administrative buy-in, planning time, resources, and training (Härkki et al., 2021; Solis et al., 2012). Co-teaching requires partnership rooted in substantial commitment, engagement, and negotiation (Rigney et al., 2021; Rytivaara et al., 2019).

GRA co-teaching involves unique elements, as co-teaching research has mainly addressed collaboration between teachers in the same building and teachers' physical co-presence in a classroom for synchronous instruction (Härkki et al., 2021). Co-teaching in the GRA often includes some asynchronous activities, and co-presence via videoconferencing involves specific challenges (Hilli, 2020; Krutka et al., 2019). GRA co-teaching partnerships may feature a greater diversity of teacher and student perspectives than is typical for co-teaching within a single school context. Although GRA planning can occur in advance, the six-week time frame of the read aloud itself could limit opportunities for teachers to build rapport and mutual understanding.

2.2. Crowdsourcing

In addition to co-teaching, GRA participation often involves the use of ideas and materials that are generated, curated, remixed, and sometimes co-created by the many participating educators. The GRA therefore includes an element of *crowdsourcing*, which is when a typically large network of individuals combines their labor to produce something or engage in collaborative problem solving (Brabham, 2013). The crowdsourcing concept was initially connected with commercial endeavors (Brabham, 2008), but it has been more recently applied to the gathering of teaching and learning ideas or resources (Donlon et al., 2020; Dunlap & Lowenthal, 2018). Crowdsourcing in education has been defined specifically as "a type of online activity in which an educator, or an educational organization proposes to a group of individuals via a flexible open call to directly help learning or teaching" (Jiang et al., 2018).

Open social media platforms often play an important role in crowdsourcing. Educators have leveraged the affordances of various social media platforms to gather and share ideas and materials (Carpenter & Krutka, 2014; Carpenter & Staudt Willet, 2021; Rosenberg et al., 2020). For instance, teachers can use popular education-focused Twitter hashtags to query other educators regarding teaching advice or to solicit content recommendations (Rodesiler, 2015), and the resulting ideas are publicly available for other educators. Teachers may serve as knowledge brokers by sharing or drawing attention to crowdsourced resource compilations (Jusinski, 2021). Educators can also crowdsource ideas when they must quickly respond to current events (Greenhalgh & Koehler, 2017). For example, educators used technology to gather resources, ask questions, and share emotional support during the shift to remote teaching caused by the COVID-19 pandemic (Carpenter, Trust, Kimmons, & Krutka, 2021; Greenhow et al., 2021).

Crowdsourcing appears to also play a role in the GRA. Because Pernille Ripp has almost exclusively chosen contemporary GRA texts, there has not typically been a large quantity of pre-existing curriculum associated with the selected titles. Traditional curriculum publishing houses may not have created reading guides or other resources. Neither has Ripp herself attempted to create an official GRA curriculum. Teachers therefore dive into the creation and sharing of materials. Some of these resources are authored by individual teachers, and others are collaboratively created. In contrast to for-profit-oriented crowdsourcing, Ripp has explicitly asked others not to try to profit off the project (Ripp, 2016), and GRA content is therefore often shared in open formats via social media (Carpenter & Justice, 2017a). For example, HyperDocs—which are interactive, digital teaching and learning materials created and freely disseminated by educators (Highfill et al., 2016)—have been developed and widely shared for many GRA texts. Similar to how Wikipedia pages are knowledge resources that are developed and improved through crowdsourcing of expertise, the GRA could lead to the creation of teaching and learning materials and practices that are intentionally refined through collaborative endeavor.

3. Literature review

In the following sections, we first review key findings from research on teacher collaboration broadly speaking, addressing associated opportunities and challenges. Second, we narrow our focus to ICT facilitated or mediated teacher collaboration.

3.1. Teacher collaboration

Collaboration among teachers can take various forms and be organized around academic disciplines, grade levels, programs, and other considerations (Reeves et al., 2017). Teacher collaboration is sometimes treated as a means to an end, and other times as an end itself. Collaboration can be mandated and highly structured, while in other cases teachers opt in and have autonomy. Collaboration can be understood to exist on a continuum that varies from teachers being more independent (e.g., a *divide-and-conquer* type of collaboration) to teachers being more interdependent (e.g., a *co-creation* approach to collaboration). Various contextual factors influence teacher collaboration (Bešić et al., 2017). The larger school and educational cultures within which collaboration occurs also affect collaborative activities (Douglas et al., 2016). Teacher collaboration is defined not just by teachers' actions, but also by their attitudes towards collaboration (Sutrisno & Pillay, 2015; Vangrieken et al., 2017); teachers' confidence, their coping mechanisms, and how they manage their fear of failure can be essential (Bullough, 2015).

3.1.1. Teacher collaboration benefits

Numerous arguments assert why and how collaboration can benefit teachers and their students, with collaboration widely regarded as a way for teachers to develop practices that support students' learning (Marrongelle et al., 2013; Wei et al., 2009). Opportunities for collective inquiry help teachers to develop their craft (Spires et al., 2018; Coburn et al., 2012; Villavicencio et al., 2021), and collaboration among teachers has been linked to greater willingness to take risks and learn from mistakes (Ashton & Webb, 1986). Research has suggested collaboration can increase teacher self-efficacy (Shachar & Shmuelovitz, 1997), and job satisfaction (Reeves et al., 2017).

Collaboration benefits can be difficult to disentangle from the type of collaboration and the context in which it was enacted; thus, there remains a lack of understanding of the particular benefits

associated with teacher collaboration's many different forms. Hargreaves and O'Connor (2017) suggested that teacher collaboration often focuses on conversation and idea exchange, and asserted that collaboration should instead concentrate on teachers' joint work. Indeed, various studies (e.g., Cousins et al., 1994; Meirink et al., 2010) have found that teacher collaboration with a strong link to teaching practice was more effective than other approaches to collaboration. Co-teaching and crowdsourcing would appear to embody such collaboration linked to teaching practice.

What is good for teachers can also help their students, and teacher collaboration has often been presumed to be associated with benefits for students (Guskey, 2000). Some studies have been able to empirically link teacher collaboration and student outcomes (e.g., Ronfeldt et al., 2015). Goddard et al. (2007) found that students performed better on average on math and reading assessments, and demonstrated better behavior, at schools with higher teacher collaboration levels. Teacher collaboration has also been shown to help teachers respond appropriately to individualized education challenges among heterogeneous student groups (Kliegl & Weaver, 2014).

3.1.2. Teacher collaboration barriers and challenges

Remedios et al. (2012) noted that, "Collaboration is often spoken of in idealistic terms for its possibilities rather than its practice" (p. 334). Research has, however, identified many challenges to successful teacher collaboration. Teachers' education philosophies, professional identities, and practices can all impede collaboration (Bullough, 2015; Härkki et al., 2021; Murata, 2002). For example, some educators may fear that collaboration threatens their autonomy (Johnson, 2003; Vangrieken et al., 2017). In addition to such internal factors, external forces can impact collaboration. The structures of teachers' work can be misaligned with collaboration (Hilli, 2020; Vangrieken et al., 2015), and micropolitics (Achinstein, 2002) and insufficient formal expectations or support (Datnow, 2011; Villavicencio et al., 2021) can complicate collaborative endeavors.

Teacher collaboration in the GRA may feature particular challenges. For instance, co-teaching partnerships can be slow to evolve in their practice (Jurkowski & Müller, 2018), and the GRA's length may not allow for such evolution. Short-term collaboration initiatives may require the prior existence of collaborative cultures for teachers (de Jong et al., 2019); some GRA teachers may not find themselves supported by such cultures. Also, short term collaborations are often influenced by previous collaboration experiences (de Jong et al., 2019), and GRA partner teachers could have quite disparate past experiences of collaboration.

3.2. Teacher collaboration with information and communication technologies

Much of the seminal teacher collaboration research has explored collaboration in physically face-to-face contexts (e.g., Achinstein, 2002; Goddard et al., 2007). Teachers, however, increasingly communicate and collaborate using ICT. These technologies may increase the efficiency or ease of communication for teachers in the same school, and facilitate asynchronous collaboration. Furthermore, social technologies can allow teachers to find more collaborators outside their schools (Macià, & García, 2016; Nami et al., 2018). The COVID-19 pandemic's impact on education has also underscored possibilities and problems associated with teacher collaboration via ICT (Greenhow et al., 2021). Understanding collaboration among educators who work in different schools is important given that lack of collaboration within individual schools has been identified as a common barrier to educational improvement (OECD, 2014).

3.2.1. Benefits of teacher collaboration with information and communication technology

Different technologies have been credited with potentially expanding the who, what, when, and where of collaboration by mitigating communication barriers, and increasing educators' access to information and people beyond their schools. Teacher collaboration need not be tied to physical spaces, as ICT can connect educators to a wider pool of colleagues (Carpenter & Green, 2017; Hur & Brush, 2009). These connections can provide access to novel perspectives, ideas, and experiences (Kop, 2012), as well as people with shared interests or needs (Carpenter et al. 2021), and can enable knowledge and content co-construction (Nami et al., 2018). Additionally, ICT can create opportunities for educators to reflect and exchange emotional support (Hur & Brush, 2009; Kirschner & Lai, 2007). The camaraderie and support available via ICT can serve as an important antidote to the professional isolation endemic to teaching in many countries (Carpenter & Krutka, 2015; Smith Risser, 2013).

ICT can allow teachers more opportunities to select their collaboration partners, instead of being restricted to those educators who happen to work in the same school (Huberman, 1995). Technologies could create opportunities for co-teaching and crowdsourcing that are less threatening to teacher autonomy than some required in-person collaboration (Vangrieken et al., 2017). Some kinds of teacher collaboration via technology may also be attractive or accessible to more introverted teachers or those whose outside-of-work responsibilities make it easier to contribute asynchronously or from a distance. Nevertheless, research on teacher collaboration via technology has principally addressed professional community and professional learning, and has attended less to collaboration oriented towards creating curriculum and instruction.

3.2.2. Challenges of teacher collaboration with information and communication technologies

ICT can facilitate connections between people, but such connectivity may not lead to effective collaboration. Wellman et al. (2003) noted that digital connectivity can sometimes actually reduce collaboration. Trust, credibility, and expertise are important to teacher collaboration, and these may be harder to assess or establish in digital environments (Booth, 2012). Social media platforms have been central to GRA collaboration (Carpenter & Justice, 2017a) and research has identified multiple challenges associated with educator social media use (e.g., Nagle, 2018). For instance, risks around *context collapse*—the potential for online content to have a potentially infinite audience (Marwick & Boyd, 2011)—may cause educators to restrict the content they post in order to avoid controversy. Educator social media spaces can be cluttered with spam, and online teacherpreneurs and education influencers bring competitive and commercial motivations to these spaces that may complicate collaboration efforts (Carpenter et al., 2022; Carpenter, Staudt Willet et al., 2020; Hargreaves & O'Connor, 2017). Furthermore, while technology allows for collaborating across borders, additional challenges for such collaborations include the logistical concerns of time differences, language differences, school structures, and different curriculum standards (Carpenter & Justice, 2017b; Hilli, 2020; Rigney et al., 2021).

4. Research questions

Our aim is to contribute to the body of literature on teacher collaboration and educational technology by addressing the following research questions:

RQ1. How did teachers collaborate with other educators in the

GRA?

RQ2. How did teachers perceive the impacts of collaborating with other educators in the GRA?

RQ2a. What benefits did GRA collaboration with other educators offer?

RQ2b. What challenges did teachers perceive during GRA collaboration with other educators?

5. Methods

In this study, we utilized sequential explanatory mixed methods (Creswell & Clark, 2017). The first phase consisted of an exploratory mixed-methods online survey. An initial survey draft was created by two members of the research team, based on our knowledge and experience of the GRA. This draft was shared with Pernille Ripp and three GRA participants from previous years for expert feedback (Olson, 2010). We made minor revisions based on these individuals' comments. The finalized survey had 27 items and three parts: informed consent, demographics, and GRA-related items. The survey included closed and open response questions about the teacher's GRA experience. Survey respondents could leave their email address to indicate willingness to participate in a follow-up interview.

The second phase of this study consisted of follow-up interviews. From the larger pool of participants who left their email addresses, we invited participation from a subset of respondents who had participated in multiple GRAs. The first and second authors together created a semi-structured interview schedule. We initially brainstormed a list of 17 prompts, which we subsequently discussed and consolidated into a final set of ten prompts (Appendix A). We also had probes for most prompts that were employed when interviewees' initial responses lacked details. The interview prompts and probes were informed by prior research on the GRA (Carpenter & Justice, 2017a; 2017b) and initial analysis of the survey responses.

5.1. Participants

The survey results are based upon 436 responses submitted by educators to an online survey during 2016 and 2017 (see Table 2 for survey respondent demographics), 47% of whom had participated in at least two GRAs. In terms of age, the largest group of respondents were between 40 and 49, accounting for just over one-third of the respondents. More than 70% of the respondents were general education classroom teachers; additionally, librarians/media specialists were a relatively large number of participants. After the initial informed consent item, not all survey items were required, and the exact number of respondents for individual survey items therefore varied slightly.

In order to extend our survey results and further explore GRA experiences, we conducted semi-structured interviews with a sample of respondents from the larger convenience sample of survey respondents. The interview sample was purposeful in that in order to hear from educators with experience in more than one GRA, we opted to only contact individuals who had participated in multiple years of the GRA. We emailed interview invitations to 69 survey participants who met this inclusion criteria and had agreed to be contacted, with four emails bouncing back. We invited the potential interviewees to schedule interview times using a scheduling app. After conducting 21 individual interviews, we determined that data saturation had been reached (Guest et al., 2006), and we did not attempt to arrange further interviews. All interviewees participated in at least three iterations of the GRA. The

interviewed educators included general education classroom teachers, librarian/media specialists, gifted & talented teachers, and school administrators from four countries (see Table 3). More than two-thirds (68%) of the participants indicated that outside of the context of the GRA, they collaborated with educators outside of their schools.

5.2. Data collection procedures

The survey was distributed to GRA participants through invitations posted to the social media platforms used by many GRA teachers (e.g., Facebook groups, Twitter hashtags) and via an email sent by Pernille Ripp to educators who registered as 2016 GRA participants. The first and second authors conducted the interviews in English via phone or videoconference; these were recorded, and subsequently transcribed. Interviews lasted between 20 and 45 min. Not every prompt was asked of each interviewee, as responses to early prompts sometimes also addressed the topics of later prompts.

5.3. Data analysis

For survey data analysis, we generated descriptive statistics and engaged in initial open coding (Saldaña, 2021) of responses to open-ended items. For interview data analysis, research team members read every transcript and individually wrote analytic memos as they read. After discussing our impressions of the data, we began line-by-line open coding (Saldaña, 2021) to develop emergent codes. We aimed to identify patterns of meaning that spanned multiple interviews. We engaged in repeated rounds of individually coding the interview transcripts followed by research team meetings to discuss coding and refine the codebook. To enhance the trustworthiness of our analysis, we engaged in constant comparison and researcher triangulation by having multiple researchers involved in all qualitative data analysis (Elliott et al., 1999). The finalized codebook featured 11 categories and 41 codes (see examples in Appendix B). Here, however, we focus specifically upon the *collaboration* category, which included 11 codes (Table 4), and the data associated with these 11 codes were therefore isolated in a separate spreadsheet. Appendix C provides an example of data and what codes were applied to that data.

6. Results

6.1. RQ1. How did teachers collaborate in the GRA project?

In survey responses and in interviews, teachers described collaborating with other GRA educators in various ways. Participants utilized various ICT as they worked together on GRA activities such as planning and preparing instructional materials. Most survey participants (62.0%) worked in schools where at least one other teacher participated in the GRA, including 33.7% who worked in schools where four or more other teachers participated. Many participants therefore could potentially have collaborated inside their schools on the GRA. However, 42.9% of survey respondents indicated that they worked with colleagues from their schools on the GRA (Table 5), so the simple presence of multiple GRA teachers in a school did not mean that within-school collaboration occurred. In the following subsections, we discuss how GRA collaboration included elements of co-teaching and crowdsourcing.

6.1.1. Elements of co-teaching

Participants described collaboration that featured various degrees of co-teaching. One common element of GRA collaboration was paired or partnered classes in different schools whose students

Table 2
Survey participant demographics.

Demographic information	n =	%
Nationality		
USA	327	79.0
Argentina	4	1.0
Australia	37	8.9
Canada	64	15.5
New Zealand	4	1.0
Mexico	1	0.2
Sweden	1	0.2
Pakistan	1	0.2
Nigeria	1	0.2
Netherlands	1	0.2
Germany	1	0.2
Guatemala	1	0.2
Total	414	
Age		
20–29	28	6.6
30–39	119	28.2
40–49	144	34.1
50–59	103	24.4
60 or older	28	6.6
Total	422	
Professional role		
Regular education classroom teacher	306	72.3
Teacher librarian/media specialist	50	11.8
Gifted & Talented teacher	16	3.8
Special education teacher	12	2.8
Instructional technology facilitator, Instructional coach, other instructional support	11	2.6
Literacy or reading specialist	7	1.7
ESL/ESOL Teacher	6	1.4
School administrator	4	0.9
Other	5	1.2
Total	423	

Note. Percentages may not sum to 100 because of rounding.

Note. Because not all survey items were required, the number of respondents for individual survey items varied slightly.

Table 3
Interview participant demographics table.

Demographic information	n =	%
Nationality		
USA	18	86
Canada	1	5
Argentina	1	5
Hong Kong	1	5
Total	21	
Professional role		
Regular education classroom teacher	15	71
Teacher librarian/media specialist	3	14
ESL/ESOL Teacher	1	5
Gifted & Talented teacher	1	5
School administrator	1	5
Total	21	

Note. Percentages may not sum to 100 because of rounding.

engaged in multi-part interactions. Various participants described how they looked for and connected with educators from outside their schools to partner for the GRA. Social media spaces were common locations for making such connections, with participants often using GRA online spaces such as Facebook or Edmodo groups, or Twitter hashtags, to solicit collaboration partners. Several interviewees also described leveraging their existing professional networks to search for collaborators. For example, one teacher explained, “sometimes I just know them from Twitter or Instagram ... and I just say ‘Hey would you be interested?’ and usually I always find someone.” Some teachers described being more selective, such as a participant who shared information about their own context in hopes of connecting with a suitable partner: “I usually put down what kind of technology I have access to, my grade level and the

type of school that I’m at, socioeconomic backgrounds, demographic breakdown so that they can understand a little bit more about my school.” Participants therefore used various approaches to find collaborators, with some embracing serendipitous connections and others being more strategic.

In addition to addressing how they found co-teaching partners, participants described various kinds of collaborative planning. Because Pernille Ripp provides the overall structure of the GRA schedule and the book selections, the participants’ planning generally occurs within the context of some broad GRA parameters. Multiple participants described brief co-planning that occurred during the six weeks of the GRA. For example, one participant depicted GRA co-planning in the following terms: “I haven’t had any experience where it’s intricate ... like it’s really quick planning.” Other teachers referred to having brief conversations the day before live interactions to confirm times, discussion questions, and what would transpire. Rather than co-planning for the entire GRA, this kind of sporadic co-planning for synchronous activities between classes appeared to be relatively common.

Co-teaching can include divide-and-conquer approaches in which teachers each assume responsibility for particular elements of planning and instruction. This could be seen in how some participants described GRA collaboration. For instance, one teacher explained how she and a partner teacher shared responsibility for learning about technologies to use in the GRA:

She said, ‘What if we were to do Flipgrid?’ And I’d say to her, ‘Well, what’s Flipgrid?’ and she would say, ‘Oh, it’s this.’ ... Or for example, I might say, ‘What about Padlet?’ And she’d say, ‘Oh, Padlet, I haven’t had a chance to investigate that. What would

Table 4
Frequencies and codebook for collaboration codes.

Code	How many of the 21 interviews included the code	Definition	Exemplar data
Collaboration description	n = 13, 62%	Describes GRA teacher collaboration activities, without explicit or clearly implied judgment regarding related benefits or challenges	“We started with a mystery Skype towards the beginning, and then as the weeks progressed, we’d check in with each other with book talks with our students. The students would come up with questions, and we would ask questions across the classes to kind of have a discussion. We did that two, maybe three times across the six weeks.”
Collaboration - General benefits	n = 13, 62%	Describes benefits, opportunities, or positives associated with teacher collaboration in the GRA	“I might recommend an article to her; she recommended books to me. Same thing. I said to her, ‘Well, have you ever looked at making thinking visible, have you done visual thinking?’”
Collaboration - General challenges	n = 16, 76%	Describes challenges, obstacles, or barriers associated with teacher collaboration in the GRA	“Lots of schools there, they refer to themselves as Google schools. So every kid has a one-to-one device, and we don’t have that here. So I’m having kids do work on paper and pencil, and then I’m having [to] spend my time getting it on to whatever.”
Benefits to local collaboration	n = 13, 62%	Describes benefits, opportunities, or positives associated with GRA collaboration with local educators (i.e., educators in the same school, school district, or city)	“[My] whole School has done the GRA for two years ... Well, it was nice for the kids because they can talk to each other about the stories. And because I see all the classrooms, as teacher librarian I co-teach with classroom teachers, so I’m always working with their classes. And so the kids knew that I knew the books. So they could talk to me about the books as well.”
Challenges with local collaboration	n = 5, 24%	Describes challenges, obstacles, or barriers associated with GRA collaboration with local educators (i.e., educators in the same school, or district)	“It was a lot of coordination, to have them go over and walk back [to the elementary]. It took up, you know, like 40 min of the class period, and their schedule wasn’t the same as ours.”
Benefits to national-level collaboration	n = 10, 48%	Describes benefits, opportunities, or positives associated with GRA collaboration with non-local educators within the same country	“Part of it was about planning the readings and the follow-up activities, for example, and to connect the book with the theme of our curriculum. For example, with <i>Amal Unbound</i> for example or <i>A Long Walk to Water</i> , we connected that with our curriculum program at school working on the SDGs.”
Challenges with national-level collaboration	n = 7, 33%	Describes challenges, obstacles, or barriers associated with GRA collaboration with non-local educators within the same country	“There’s a lot of people who want to do things, but the execution is not always there, you know? Sometimes when things get really big, you really have to spend some time figuring out how it’s going to work for you, and trying to make a large community a smaller community, is kind of how I look at it. Sometimes the follow-through with other people can be challenging.”
Benefits to international collaboration	n = 8, 38%	Describes benefits, opportunities, or positives associated with GRA collaboration with educators from other countries	“They [students] need to see also how other cultures create and collaborate, how other cultures communicate with one another, what is best for them, what isn’t, you know just customs of other cultures, too.”
Challenges with international collaboration	n = 12, 57%	Describes challenges, obstacles, or barriers associated with GRA collaboration with educators from other countries	“I’m assuming that a lot of the schools that can’t participate in the global side of it because they just don’t have the means to do it, is my guess, and the time difference is huge too.”
Extending collaboration to include partners in the community	n = 7, 33%	Describes including community members (e.g., family members, locals with expertise related to GRA text topics) as guest speakers	“[I] bring people of different backgrounds into our classroom. We’re building bridges [after reading <i>A Bridge Home</i>] next week, and one of the engineers that is coming is not only female, which is exciting enough, but she’s also Asian.”
Extending collaboration beyond the GRA	n = 7, 33%	Describes collaborative activities among GRA partner teachers that evolved to include elements beyond those related to the GRA	“He [the GRA partner teacher] was interested in continuing with some sort of thing to encourage choice reading, so we continued with a monthly book review.”

Table 5
Types of collaboration engaged in by participants.

“Please indicate ways in which you collaborated with other educators in order to implement the GRA (check all that apply)”:	%	n =
Used ideas/materials/curriculum created by other teachers participating in the GRA.	64.2	283
Shared my own ideas/materials/curriculum with other teachers participating in the GRA.	62.1	274
Modified ideas/materials/curriculum created by other teachers participating in the GRA.	60.8	268
Worked with colleague(s) from my own school to plan the GRA.	42.9	189
Co-created materials/curriculum with other teachers participating in the GRA.	21.1	93

Note. Percentages do not sum to 100% because respondents could select more than one item.

we do with that?’ And I would say, ‘Well, I’ll take care of the Padlet. You take care of the Flipgrid.’

In this case, it is noteworthy that the partner teachers divided up the initial work of familiarizing themselves with the technologies, but did subsequently “educate each other on how it works.”

In some instances, participants described collaborative planning that reflected the kind of intensive, interdependent partnership

that many co-teaching advocates would consider ideal. For example, one participant stated that she designed GRA assignments with her partner teacher beyond those in which their students directly collaborated. Unlike the aforementioned “quick” planning, this participant reported that, “We just spent really hours on the phone together.”

Teachers can potentially maintain collaborative partnerships beyond a single GRA iteration, and multiple participants had done

so; these multi-year partnerships often involved more extensive co-planning. For example, a teacher described co-teaching with the same teacher for two consecutive GRAs:

We planned lesson by lesson ... we planned out, like, 'Are we going to concentrate on the theme here? Are we going to concentrate on character development in this section?' ... And we would literally spend an hour [planning], I think pretty much each week.

When collaboration extends beyond a single GRA iteration, teachers can also reflect together. For instance, a teacher explained that she and her partner reflected on the prior year's experience when initiating planning for the subsequent GRA.

In terms of the implementation of GRA teaching and learning experiences, there were echoes of the varied degrees of co-planning. Some partner teachers had their students interact a few times sprinkled throughout the GRA. Many partner classes appeared to read the GRA text in parallel but only occasionally directly, synchronously communicate. Due to differences in time zones, school bell schedules, and calendars, asynchronous interactions between classes were sometimes easier to coordinate. Distinct from traditional notions of co-teaching as reflecting physical co-presence of teachers in a classroom for synchronous instruction, GRA co-teaching regularly featured asynchronous activities and educators working with teachers outside of their schools. GRA collaboration did not require that teachers always shared the stage of live teaching in the way that it does in some co-teaching contexts.

GRA teachers had some freedom regarding maintaining their individual teaching styles or making compromises based on their partner teachers. For example, one teacher said of working with her partner, "We both come up with something and then we can tweak it to meet our needs." However, some participants described adjusting their teaching to better align with their GRA partner. For instance, one educator who had participated in the GRA since its first year commented that, "If a teacher is regimented, I'll do what they want ... I can make that work." Another participant said, "We do a lot of compromising ... so that she's making her goals, and I'm meeting my goals as well." Also, participants mentioned scenarios in which one partner assumed a more leading role. One teacher explained that in "my first years I was kinda led by the other educators doing it," but that she had gradually taken on more leadership in her GRA co-teaching.

Some participants described quite profound GRA co-teaching partnerships. For example, one U.S. 6th grade teacher had developed a strong rapport with a teacher in another state. She explained that GRA collaboration with this teacher "was really fun. It wasn't 'you have to do this,' ... It felt like I'm teaching with somebody else but not in the room with me." This partnership was initially tied to the GRA, but it had grown to include the sharing of professional readings and the co-creation of content for teaching outside of the GRA context.

6.1.2. Elements of crowdsourcing

In addition to collaboration by GRA partner teachers, participants described more diffuse and ad hoc forms of collaboration. As previously noted, resource sharing is important because GRA texts are often recent publications for which pre-existing curricular materials are lacking, and Pernille Ripp herself does not attempt to create an official set of curricular materials for the texts. Although some co-teaching partnerships may create all their GRA materials, participating teachers often also tap into the larger population of GRA teachers to find and share ideas, resources, and activities. GRA teachers use various online spaces to share materials and discuss

GRA teaching and learning. For example, one participant stated that to inform her own GRA planning, she would go "on social media ... and see what everyone else is doing to get some ideas there." The large network of GRA teachers combining their labor to produce and share associated teaching and learning materials reflects a type of crowdsourcing.

Almost two-thirds of survey participants (64.2%) indicated that in their GRA teaching they used ideas, materials, or curriculum created by other GRA teachers, while almost as many participants (62.1%) reported they shared their own ideas, materials, or curriculum with others (Table 5). Resource sharing thus seemed a common aspect of GRA teacher collaboration, and this sharing often was facilitated by ICT. An elementary school teacher who had participated in four GRAs commented, "Usually there's [sic] so many resources online, [teachers] don't need to, like, come up with [resources] themselves." Another participant who created some of her own GRA materials also found materials sourced from other teachers to be quite valuable: "Some people are very creative in making things that would tie to the standards and have the vocabulary or comprehension questions." Other participants praised the digital resources that have been created for most GRA texts in recent years and are widely shared among participating teachers, such as the following two comments:

"The hyperdocs that the teachers devise are wonderful"

"Most years I've used one creative Kahoot ... a lot of people create those during the GRA."

These quotes exemplify how the crowdsourcing of materials allowed participants to benefit from other GRA teachers' creativity and efforts.

Crowdsourced GRA materials were generally not treated as immutable. Instead, a culture of remixing prevailed, with the majority of survey respondents (60.8%) modifying ideas, materials, or curriculum created by other GRA teachers (Table 5). HyperDocs, for example, are treated as Open Educational Resources (OER), and users are encouraged to modify them as they see fit. The fact that the GRA occurs over a specific 6-week window may also encourage ongoing creation and revision during this time period. One participant described the resource sharing and discussion that unfolds on social media among many teachers during the GRA: "[The resources] are right there and people are talking about ideas and you could post a question that, 'I'm thinking of doing this. What do you all think?'" Some teachers also worked in small groups to share the load of GRA resource creation; for example, one participant described how in an Edmodo group for GRA participants, an individual teacher each took responsibility for creating the discussion questions for one week of the GRA. Another teacher began a collaborative slide deck: "People would add to the slides. The book was something about being all around the world and I just created one and kept sharing it on Twitter and people shared where they were from, and added a picture, and I asked a question or two." Crowdsourcing therefore involved individually created resources that were then shared with the larger GRA community, as well as materials co-created by multiple participants who were not necessarily partner teachers.

6.2. RQ2. How did teachers perceive the impacts of collaborating in the practice of GRA?

On the whole, the participants had positive perceptions of the GRA experience for themselves and their students, and overwhelmingly stated intentions to participate in future GRAs (Table 6). In the context of these positive overall perceptions, we

Table 6
Perceptions of the GRA.

"Rate the overall Global Read Aloud experience for you and your students."		
Answer	n =	%
Poor	2	0.5
Fair	20	5.4
Good	132	35.8
Outstanding	215	58.3
Total	369	100
"Will you participate in future Global Read Alouds?"		
Answer	n =	%
Yes	354	95.9
No	0	0.0
Unsure	15	4.1
Total	369	100

describe in the following subsections the reported opportunities and challenges specifically related to GRA teacher collaboration.

6.2.1. RQ2a. What benefits did GRA collaboration offer?

Some participants described general benefits from collaborating with other GRA educators. For example, a teacher who had participated in three GRAs stated, "I think collaboration benefits me. It helps me organize and put things into an order ... I think I'm just the type of person that enjoys collaboration and listening to other people's ideas and how that will benefit my students." Some participants spoke specifically to the benefits of the collaboration that occurred with partner teachers. One teacher who had engaged in an extensive co-teaching with another GRA educator stated,

It was great because I learned a lot from her because she taught in an IB school and internationally, so that was very different to see what, you know, the standards of that school district compared to a public school. And she had that back, the experience of a public school ... And it's just neat to learn and to see what other schools teach.

As seen in this quote, the benefits of collaboration were not limited to the GRA itself. Multiple teachers mentioned how GRA participation had influenced the kinds of texts they read with their students outside of the GRA. For example, an elementary school teacher said,

Because of Global Read Aloud, I have connected with educators that can help me find those [better] stories. And then I'm bringing better literature into my building ... which is leading to deeper discussions about their connections with books. And [students] coming and saying, 'I really liked this book. Do you have any more like this?'

Related to co-teaching, participants mentioned several opportunities associated with GRA collaboration, including working with educators with similar interests or philosophies. One participant described GRA teachers as "like minded in that we're not ... we're not over planners, we just want to make an authentic experience." Another participant considered the GRA well-suited to close collaboration among teachers because "It's flexible and doesn't dictate anything on you." Although participants did not explicitly use the term *crowdsourcing*, they referred to benefits associated with GRA users combining their labor to create materials. For instance, one teacher commented, "There's some hidden benefits in that I have all these materials as a teacher that are right at my fingertips and have come from a lot of teachers who are really excited about the whole process ... Just the shared resources that

have come out of it are amazing."

6.2.2. RQ2b. What challenges did teachers perceive during GRA collaboration?

Educators described various challenges associated with GRA collaboration. Participants most frequently mentioned logistical challenges around co-teaching. Although ICT can facilitate connections between distant teachers, collaboration among such far-flung educators involves significant logistical hurdles. To avoid such hurdles, some participants chose to collaborate with GRA educators closer to home. For instance, one U.S. interviewee stated, "I have yet to connect with a school outside of the country. I think, just because of the logistics."

Time-related challenges were frequently mentioned in surveys and interviews. Various GRA teachers noted that time zone differences limited how much they could engage their classes in synchronous activities with their partner teachers' students. For example, a participant based in Argentina could not coordinate as many live activities as she had hoped with her partner teacher in Asia: "When it was Singapore, it was very difficult." Schools often operate on various bell schedules, with different length classes, and different class meeting frequencies. Participants noted different school holidays in Canada and New Zealand during the GRA, and a Canadian teacher mentioned how two teacher professional development days got her class out of sync with her partner teacher's class. Such time-related challenges complicated efforts to have partnered classes progress through the GRA texts together. A Canadian teacher commented that during live videoconferencing, "It was always a worry that we might be behind or ahead of other classes and spoilers might happen." Time scarcity was also noted as a challenge by some participants who felt that they and/or their partner teacher had insufficient time to dedicate to co-planning.

Technology itself presented some logistical challenges to collaboration. Multiple participants commented on how their own schools and their partner teachers' schools used or supported different technology platforms, which complicated the teachers' efforts to enact particular kinds of co-teaching. For example, one participant lamented that activities she could plan for with her partner teacher were limited because of technology that was "blocked, banned, or doesn't work anymore in our district." The multiple technology platforms used in the GRA also created challenges for some users who indicated they would have preferred a central platform or online space for finding GRA collaborators and resources.

In addition to logistical concerns that were external to the teachers themselves, some challenges for GRA collaboration were identified that were internal to the teachers. For example, several participants noted that their own technology skills and confidence

limited the ambition of their GRA collaboration. Another participant felt she had been overambitious, and as a result “participated in too many connections that demanded sharing of assignments.” Several teachers explained that GRA educators who attempted to pair their classes were not always a good match. For example, a teacher with nine years of GRA experience commented, “Sometimes it’s just not a great fit with the teacher.” Various participants also noted that in some cases collaboration proved challenging because of teachers who were perceived to not follow through upon their commitments. One teacher even critiqued her own efforts at collaboration, stating, “I have to admit, I’m one of those people that’s burned people. I started out great and then I just kind of fade and then it’s been two weeks since I contacted them, and, well, I’m too embarrassed to contact them now.”

7. Discussion

These results describe the technology-mediated teacher collaboration that occurs in the GRA, and explore some of the associated benefits and challenges. ICT reportedly facilitated collaboration via co-teaching with GRA partners and crowdsourcing materials for GRA use. Our results align with recent research that suggests technologies can offer new pathways for teachers’ collaboration (García-Martínez et al., 2020; Hilli, 2020). Many kinds of teacher collaboration focus on conversation and idea exchange, despite collaboration with a strong link to teaching practice having been shown to be more effective in changing teachers’ beliefs (Cousins et al., 1994; Datnow, 2011; Hargreaves & O’Connor, 2017; Meirink et al., 2010). The GRA offers an example of teacher collaboration that is focused on the planning and implementation of concrete activities and tied to specific texts, rather than on the sharing of generic ideas or resources.

With the COVID-19 pandemic increasing attention to online teaching, how teachers can collaborate via technology should be of continued interest. In contrast to COVID-19-induced emergency remote teaching (Hodges et al., 2020), the GRA provides a case worth studying given it has existed for a decade and participation is generally teacher-initiated. With many GRA co-teachers connecting via open social networks, the program appears to offer opportunities for what Kop (2012) has called *serendipitous learning*, in which people benefit from unexpected learning that results from technology-facilitated interaction with expansive networks. Additionally, although ICT are sometimes used simply to replicate more traditional educational practices, the co-teaching and crowdsourcing that occur in the GRA seem to represent relatively novel activities that would be significantly more complicated to enact without ICT.

7.1. Co-teaching

Co-teaching has received prior attention from researchers, but typically focused on co-teaching that involves two teachers who are physically co-present in the same classroom, synchronously engaged in teaching (e.g., Mastropieri et al., 2005; Rytivaara et al., 2019). This research therefore adds to the literature by exploring an under-researched type of co-teaching and contributes to an expanded understanding of the range of possible formats for co-teaching. The participants engaged in technology-mediated co-teaching with partner teachers who worked at schools in other regions, countries, and continents. Although videoconferencing allowed for some co-teachers to engage in synchronous teaching and learning activities with their students, the participants did not share physical space. Our results describe challenges that can arise when teachers try to leverage technology to co-teach across geographical distances. Various time-related obstacles complicated

efforts to arrange synchronous co-teaching and maintain parallel progress through curriculum. In addition to such logistical matters, the human element also resulted in some co-teaching challenges, such as partners sometimes being unable to fulfill agreed upon co-teaching arrangements. ICT do not provide a solution for the many complications that arise when educators try to share the complex work of teaching.

These challenges to GRA teacher collaboration align with Ertmer’s (1999) research on barriers to technology integration, with logistical matters operating as first order barriers that were external to the teachers, and the other concerns relating to second order barriers that were internal to teachers. These results are also consistent with research on co-teaching in face-to-face settings that suggest the importance of co-teacher compatibility and clearly defined roles and responsibilities (Friend, 2008; Mastropieri et al., 2005). The opportunities and challenges associated with co-teaching in the GRA may vary widely depending on the teachers involved, their interests and needs, and their work contexts (Noonan, 2019).

7.2. Crowdsourcing

Instead of relying upon Pernille Ripp or traditional curriculum publishers, GRA teachers created, co-created, shared, and gathered resources, with technology playing a key role in this crowdsourcing. There are various crowdsourcing strategies, including crowd voting and crowd funding, but the GRA appeared to primarily involve crowd creation and crowd wisdom (Howe, 2008; Solemon et al., 2013). Our results are consistent with findings from research in higher education (Donlon et al., 2020; Dunlap & Lowenthal, 2018) and medical education (Blackwell et al., 2016) that suggest crowdsourcing can be a viable method for collective education resource creation. Crowdsourcing has also been shown to build trust among participants and increase participants’ desire to collaborate (Donlon et al., 2020), and these dynamics may well be present among GRA educators. First time GRA participants, for example, may be motivated to continue with the project based on the quality of the resources that they encounter. Cormier (2008) suggested that in online spaces or communities where knowledge is socially constructed, “the community is the curriculum” (para. 11), and there appear to be echoes of this in the GRA. Teachers who contribute to GRA crowdsourcing have an opportunity to affect teaching and learning that occurs outside their own classrooms or schools, and teachers who access information and resources from crowdsourced curations potentially benefit from the collective wisdom on offer.

Our findings highlight the variety of possible models for crowdsourcing in education with potential for transferability (Yin, 2016) to other K-12 contexts. Although crowdsourcing often occurs in response to an official call, is managed by a leader, and relies upon a central hub (Donlon et al., 2020; Howe, 2008), GRA crowdsourcing has been relatively more organic. For example, there has never been a single, organized repository for GRA resources and neither does Pernille Ripp offer a formal call to crowdsource GRA materials. As the GRA demonstrates, the range of possible uses of and strategies for crowdsourcing in education is diverse, and future theorization and research on crowdsourcing can benefit from taking this into consideration.

Consistent with other crowdsourcing initiatives in education (Donlon et al., 2020), social media platforms have played an important role in GRA crowdsourcing. Prior research has suggested that teachers can act as both givers and receivers of knowledge in social media spaces (van Bommel et al., 2020), and the GRA demonstrates that these spaces can also facilitate the giving and receiving of teaching and learning materials and guidance. The

openness and ubiquity of social media platforms can be a boon to crowdsourcing by increasing awareness of crowdsourcing initiatives and by allowing for wide sharing of ideas and resources. However, the quantity of content in some educator social media spaces can be chaotic and overwhelming for some users (Carpenter & Harvey, 2019; Staudt Willet, 2019), and reliance on social media could make it harder for crowdsourced content to be curated or indexed in ways that could make it accessible and available to more teachers.

7.3. Limitations and implications for practice and research

This research is limited by its reliance upon self-report surveys and interviews. The organic nature of the GRA project and the initial convenience sampling with the survey means we are not able to present a survey response rate. The participants may not represent trends among the larger population of GRA teachers. Also, given that GRA participation is generally voluntary and supplemental to standard curricula, GRA participants may be distinct from the general population of teachers. Despite these limitations, this research offers some implications for practice and research.

In an interconnected world, opportunities for cross-school collaboration will continue to increase and understanding of GRA experiences can inform the practice of and support for such collaboration. The same year the GRA began, it was suggested that “collaboration in innovative, temporary, and voluntary teams could be a promising direction for teacher professional development” (Meirink et al., 2010, p. 161). Such teams need not be limited to educators who work in the same building, and this research points to possibilities for meaningful cross-school collaboration. Instead of relying exclusively on physical co-presence for co-teaching, special education co-teaching may also sometimes benefit from leveraging ICT affordances. GRA-type co-teaching potentially offers teachers powerful professional learning through the direct co-construction of educational experiences (Rytivaara et al., 2019; Zwart et al., 2007). Policy makers and school administrators may consider how to encourage participation or help teachers to be effective in co-teaching and crowdsourcing like that seen in the GRA.

Teachers who look to engage in technology-mediated collaborative projects may need support and certain dispositions. Given its organic, multifaceted, and fluid nature, GRA teachers may benefit from possessing high levels of resourcefulness and self-efficacy. Online colleagues’ education philosophies may not be initially evident, and co-teachers should be aware that they may encounter tensions or fundamental disagreements. However, by taking initiative to participate, GRA teachers may position themselves to contribute to the import and export of ideas for their schools. Also, the data for this research pertained to GRA experiences prior to the COVID-19 pandemic, which has subsequently forced many teachers to become more adept at using video-conferencing platforms. More teachers may feel confident now to incorporate video-conferencing into future GRAs or similar projects.

The ground is fertile for further GRA research, and teacher collaboration via technology to crowdsource educational materials and engage in co-teaching should be of continued interest to the field. Future studies could analyze the curriculum and instruction artifacts that result from co-teaching and crowdsourcing in the GRA and similar projects. More investigation is needed regarding wise practices for co-teaching via video-conferencing platforms (Krutka et al., 2019). As technologies both create opportunities for connections and increase users’ expectations for personalization, research is needed on the tensions between autonomy and collaboration (Vangrieken et al., 2017) that could emerge for teachers who collaborate in digital contexts. Researchers could investigate how educators who collaborate via ICT develop trust,

reach consensus, and navigate disagreements. Differences in teaching philosophies and personalities will inevitably arise in teacher collaboration, and as such tensions are negotiated—productively or not—geographically distant teachers may experience distinct dynamics from teachers in face-to-face contexts. For example, researchers could explore how cultural factors influence teachers’ understanding of and practices related to GRA co-teaching and crowdsourcing, given that teachers from various countries and regions participate and that cultural norms, expectations, and practices around teacher collaboration vary (Frailon et al., 2020).

Researchers could also explore the intrinsic, extrinsic, and competitive motivations of educators who contribute to GRA crowdsourcing (Donlon et al., 2020), and the role of teacherpreneurship (Berry, 2015; Shelton & Archambault, 2018, 2019) in the GRA. Participation in the GRA arguably requires some entrepreneurial spirit, as it is usually self-initiated, and in many cases, teachers may be the only ones in their school doing so (Carpenter & Justice, 2017a).

8. Conclusion

Arguably, the most important components of educational situations are people and cultures, rather than technologies (Papert, 1987), and it is therefore important to emphasize that the collaboration that occurs in the GRA is likely indelibly marked by Pernille Ripp’s vision for and leadership of the GRA, by the educators who have built on her vision, and by the cultures that have been developed by the participating teachers over the past decade. ICT are therefore only part of the story of educator collaboration in the GRA. However, the GRA does provide an intriguing example of how such technologies may facilitate new collaboration opportunities. Online communities, networks, and spaces have allowed people to connect in new ways and form affinity-based groupings that span traditional boundaries (Macià, & García, 2016; Trust & Prestridge, 2021). As seen in this research, ICT can also facilitate teacher collaboration in the form of far-reaching crowdsourcing and new kinds of co-teaching. The GRA offers a window into some of the possibilities and problematic elements of such technology-mediated collaboration that can inform future practice and research.

Appendix A

Interview prompts and probes

1. How many other educators at your school were involved with the GRA?

Probes.

- a. How do you think it affected the experience of you and your students that there were X other educators at your school involved with the GRA?
 - b. Did you collaborate with any of the other educators at your school involved with the GRA? If so, please explain how.
 - i. Collaboration in planning/creating curriculum
 - ii. Collaboration in actual teaching and learning (e.g. bringing classes together)
 - c. Was your GRA participation supported by other educators such as ITFs or coaches?
2. How, if at all, did you collaborate with other educators from outside of your school to implement the GRA? (if they did not collaborate within or outside, go to #4)

Probes.

- a. Planning/creating curriculum
- b. Live events - Videoconferences
- c. Asynchronous student activities - Padlets, responding to blogs, etc.
- 3. What challenges emerged in your efforts to collaborate with other educators?

Probes.

- a. Different school contexts
- b. Different teaching styles
- c. Different curricula
- d. Cultural differences
- 4. How was the teaching and learning that took place during the GRA similar and different to the teaching and learning that normally occurs in your class?

Probes.

- a. Literacy instruction
- b. Treatment of Literature
- c. Technology component
- d. Global component
- 5. What benefits do you perceive to the GRA for your students?

Probes.

- a. Did students respond positively?
 - i. Is this similar to or different than how they normally respond?
 - ii. What aspect of the GRA did your students seem to like most?
- b. To what degree does the GRA align with your school/district/state's policies, curricula, initiatives, etc.?
 - i. (If lack of perceived alignment), how did you reconcile this lack of alignment?
- c. Did you see students making connections?

- i. Connection with reading
- ii. Connection w/other children
- ii. Connections w/author
- iv. Technology connection
- v. Global connection, What kind?
- 6. How, if at all, did your students interact with people from different cultures during GRA? (if they did not, go to #7)

Probes.

- a. What aspects of the GRA were the most conducive for cross cultural interactions?
- b. Did any difficult or challenging cross cultural interactions occur during the GRA? If so, describe.
- c. How, if at all, did you prepare your students for cross cultural interactions that occurred during the GRA?
- 7. Has your participation in the GRA affected anything about how or what you teach outside of the GRA?

Probes.

- a. Collaboration w/other teachers (local, or not)
- b. Collaboration w/other classes
- c. Technology component
- d. Global component
- 8. Over the years, what has changed and what has remained the same in the way you do the GRA?
- 9. Possible individualized follow up prompt based on specific survey responses.
- 10. Is there something important about the GRA that we have not discussed in this interview that you feel should be mentioned?

Appendix B

Example categories and codes

Category	Code	Definition	Exemplar Data
Student benefit - community building	Social reading	Being able to read texts not as a private/individual endeavor but a larger social one	"Often reading has this reputation of being a solitary activity, and I try to show them that as a reader, you're part of a community. Like, our class or grade community, our school community, and then also global community ... We enjoy the same books or sometimes very different books. But we can connect and share this with each other."
	New vertical or horizontal teaching & learning opportunities	Within a school or neighboring schools (of different levels), the GRA provides novel chances for learning together across or within grade levels	"They would go outside at recess and talk to the other fourth-grade teachers or fourth-grade kids about it. My fourth graders were able to talk to the fifth-grade students about it as well. So they don't know they are book talking, but they are at recess mostly or before school, 'Did you guys get to that part at all?'"
Admin/Policy Context	Context affordances	Contextual factors such as the flexibility of curriculum, reading choices, daily schedules, supportive administrators support or facilitate GRA participation or success	"He [the principal] lets me do all sorts of crazy things and supports me on it. Because he loves what it does for our students. So I'm always coming up with like crazy collaboration ideas, video chatting with people around the world and stuff."
	Context constraints	Contextual factors such as the rigidity of curriculum, mandated pacing guides, and/or lack of administrative support or understanding prove challenging for GRA implementation	"It can be demanding in the sense of, we do have other programs and projects that we have to be a part of. So sometimes the time is limited to devote to the Global Read Aloud."

Appendix C

Example Coded Data

Kate (pseudonym): I can tell you that there's less international teachers or there's less international teachers that are connected because I have a Facebook group, and once someone posts, "I am from Australia, who would like to Skype?" they'll get like 30 [teachers responding]. Yeah, so you know US [GRA] teachers are dying to connect globally. My friend is in the third grade. She does do mystery Skype around the world. I don't because I'm first and [the students] barely know that they live in Connecticut. I know that she has said, she will say to me "If there's a country outside the US looking to Skype I have to hop on it" ... It's also harder to connect time wise, that's where Padlet came in, Padlet was really handy because they could just go on it whenever they wanted... A couple years ago, we did *Wild Robot* [GRA text] and I connected with a teacher in China and the Padlet was great because we would have never been able to do it [without Padlet]. Some teachers forget, so that gets frustrating. So you're ready to Skype and they [the other class] are not there. And then, of course, there are normal problems with technology. There's one teacher in Canada that we were going to Skype and they had a snowstorm then we had a snowstorm, you know, so just normal problems in the schools and then forgetfulness too I think.

Code: Challenges with international collaboration

Code: General challenges

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