The Social Construction of Online Communication Systems toward Facilitating Learning among Children with Developmental Delays

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The shift to online instruction has been challenging for Special Education (SpEd) practitioners given that in-person guidance is essential to the learning of Children with Developmental Delays (CWDDs). School administrators used various online and computer-assisted tools to handle the continuation of classes, one of which is an Online Communication System (OCS). Our study examines how an OCS is used to facilitate learning among CWDDs using Pinch and Bijker's (1984) Social Construction of Technology. Employing online ethnography as our research method, we used participatory observations in one SpEd class and conducted semi-structured in-depth interviews to generate data for our study. Findings showed that although teachers, parents, and students use an OCS within their terms, they still adhere to how each communication platform is primarily intended to be used. However, they negotiate such common usage when resolving issues that arise in their OCS. We then provided suggestions from a social constructivist perspective to better utilize an OCS for online learning. Lastly, we suggest that future researchers widen the scope of the study in terms of the time frame and involved participants.

Keywords: social construction of technology, online communication systems, distance education, children with developmental delays, online ethnography

The COVID-19 pandemic has forced schools to adhere to Distance Education (DE) as part of safety precautions to stop the spread of the coronavirus. School administrators in the Philippines have since tried to employ "communication systems" to enhance interactions among participants in the online classroom (Hernando-Malipot, 2020). An online communication system (OCS) involves different online platforms harnessed to facilitate learning and social interaction through synchronous and asynchronous means (Adonis, 2020; Cook, 2012). Standard OCSs are primarily intended for teachers and learners in basic education classes; however, Special Education (SpEd) classes involve the parents in the communicative process to aid the students in navigating the virtual education setup (Villano, 2020).

The transition to DE puts Children with Developmental Delays (CWDDs) in a disadvantaged situation (Hill, 2020; Magsambol, 2020). CWDDs struggle with the absence of direct contact with teachers, which is necessary for their learning. Moreover, anecdotal evidence suggests that the lack of physical interaction in DE has contributed to the academic regression of CWDDs (Magsambol, 2020; Yazcayir & Gurgur, 2021).

That said, studies on distance learning among CWDDs are still few and far between—especially in the Philippine setting. Although a few scholars have already probed the experiences of the online SpEd classroom, there is yet to be sufficient literature on the technological usage of its stakeholders to communicate with one another (Balading et al., 2023; Derasin et al., 2023). Thus, it is imperative to investigate how an OCS can be enhanced to reduce barriers to online learning.

In this undertaking, an OCS serves as a focal point for progress monitoring and student-teacher conferences (Hayhurst, 2021). This is especially salient for CWDDs, who require additional assistance due to their divergent abilities (Cercone, 2022; Toquero, 2021). However, such possibilities of an OCS in helping CWDDs are yet to be realized due to several problems. The underlying problem is that it would take so much time for all stakeholders to successfully navigate the mediated teaching-learning process (Coman et al., 2020; Magsambol, 2020).

More so, it is significant to note that while the study was situated during the pandemic, its effects still resonate in the post-pandemic setting. These new platforms have always remained, particularly as schools saw them as an alternative modality of learning today (Stoian et al., 2022; Tzimiris et al., 2023; Xiao, 2021). Although the study's implications cannot be deemed universal due to the nature and size of its unit of analysis, we posit that it still clarifies the process of communication among stakeholders of CWDD classes.

Research Problem and Objectives

Through the lens of the Social Construction of Technology (SCOT), the study aims to answer the research question: "How are online communication systems harnessed to facilitate learning among children with developmental delays?'

The general objective of this research is to delineate how online communication systems are harnessed to facilitate learning among CWDDs. Specifically, it aims to:

1. Describe how teachers, parents, and CWDDs use an online communication system to participate in online learning for CWDDs;
2. Characterize the relationships of the different groups in an online communication system;
3. Describe how various issues in online learning are resolved using an OCS; and
4. Assess, from a social constructivist perspective, how an online communication system could be better utilized to facilitate learning among CWDDs.

Literature Review

The COVID-19 pandemic has presented formidable challenges to the conventions of global education systems, dismantling the default modality of learning for most students: neurodivergent, with disabilities, or otherwise (Vachkova et al., 2022; Verulava et al., 2022). It forced education administrators to assume a drastic shift in pedagogical delivery and rely on alternative modes of learning that do away with in-person contact and interactions. In the matter of SpEd, governments from the West resorted to e-learning or virtual learning (Trzcińska-Król, 2020). Asian and African countries followed suit through policies and instructional recalibrations (Allaham et al., 2022; Permata et al., 2022; Ojetunde et al., 2021). As such, the Philippines implemented distance education (DE) for students with disabilities and their non-disabled peers to continue delivering instructions and lessons while observing stricter health protocols (Toquero, 2021).

DE as a learning modality was intended for students with disabilities because they are more likely to drop out of regular classes than their non-disabled counterparts (Cavanaugh et al., 2013). Recent studies have confirmed that the same holds, as DE is still a viable option among persons with disabilities or PWDs (Allday & Allday, 2011). However, there are still challenges in DE that PWDs must hurdle. For instance, CWDDs in online learning programs are reported to have difficulties controlling and monitoring their academic progress (Moallem, 2015). Their behavioral and academic limitations warrant further assistance from more authoritative figures like parents and teachers (Xiao, 2021). Parental involvement in CWDDs' education is particularly critical because parents must take on some of the teachers' duties, given that online learning continues beyond synchronous classroom sessions (Cahapay, 2024).

The extant literature widely acknowledges the importance of open communication in reducing feelings of isolation and increasing productivity in a distance learning environment. Different modalities of learning—from synchronous (live, time-bound sessions) to asynchronous (time-delayed and flexible means of learning) and mixed modalities (a combination of both)—have been developed to deliver education in an online setting (Berry, 2017; Moallem, 2015). Simply put, the plethora of educational apps has provided opportunities to maximize the participation of those with special needs (e.g., auto-generated subtitles for deaf students).

CWDDs need additional provisions for mediated interaction. As such, there must be a continuous exchange of phone calls, e-mails, and text messages to ensure the immediate resolution of any implementation issues in the SpEd classroom. Personalized conversations are also deemed essential to bolster the presence of the involved social groups in the online classroom (Basko & Hartman, 2017). These needs give rise to the design of an OCS that integrates various communication platforms to maximize immediate and meaningful interaction among teachers, parents, and CWDDs.

In the Philippines, the situation of DE for SpEd lacks rigorous documentation, with a few studies discussing the viable communication setups for online SpEd classrooms. For instance, research on SpEd during COVID-19 lockdown measures has often cited the crucial role played by social media in remotely delivering education (Insorio & Olivarez, 2021; Toquero 2021). Given the absence of in-person guidance, parents took the roles of teachers, which was also doubled with them helping their children navigate online communication platforms and assistive technologies (Cahapay, 2024; Xiao, 2021). However, the dynamics between teachers, parents, and students within online communication systems warrant further probing as their relationships are instrumental in DE among CWDDs. This study aims to fill the said gap as it analyzes the voices of the salient participants in the virtual educational setup.

Study Framework

The Social Construction of Technology (SCOT) is a constructivist framework that explores how social processes constitute technological innovations (Bijker, 2009). SCOT privileges the role of human agency in the development of technologies, and it views technological development as the outcome of a series of negotiations and selections of meanings among the users of a technology (Bijker, 1995). The SCOT terminology employs the term relevant social groups or RSGs to refer to technology users.

SCOT posits that analyzing how RSGs construct meanings about a technology entails looking at three core processes: interpretive flexibility, stabilization, and closure. Interpretive flexibility refers to how each RSG (i.e., teachers, parents, and students) attributes different interpretations of how a technological artefact is to be harnessed (Bruun & Hukkinen, 2003; Fulk, 1993), which, in this study, refers to an OCS.

Although interpretations may vary in the early stages of technology use, a point of stabilization is eventually reached. Stabilization is the process in which RSGs slowly adopt similar meanings about a technological artefact (Pinch & Bijker, 1984). Stabilization then culminates in closure, which is the "irreversible end point of a discordant process" (Bijker, 2009, p. 69), hence creating a stable system of technology usage amongst RSGs.

Methodology

We conducted our study in October 2021, which is during the middle of the pandemic and lockdown measures in the country. We followed a qualitative research approach to our SCOT-anchored study to assess how teachers, parents, and students utilize an OCS in the SpEd classroom. Our research method is online ethnography that employs traditional ethnographic methods using digital and computer-assisted tools (Junnilainen & Luhtakallio, 2016). For data construction, we used both participant observation and interviews.

Our observation guide was divided into four sections. Our initial descriptions and observations were written down in the first section, which constituted our "rough notes" and memos. The second section served as a systematic means of documenting the occurrences in the classroom to capture how the RSGs negotiated the platforms in an OCS. The third section was concerned with the conflicts that arose during the observation period, as well as how the RSGs resolved these tensions. The final section of the instrument then encapsulated how the RSGs approached these concerns, whether directly to the concerned party or coursed through others. On the other hand, we used semi-structured in-depth interviews to probe how the participants adapted to an OCS vis-à-vis the learning progress of CWDDs. We developed an interview guide containing questions about the informants' attribution of meaning to an OCS, relational dynamics in an OCS, and conflict resolution schemes in online learning. Pursuant to the ethical conduct of research, we secured the informed consent of our participants prior to data construction.

Data Generation Procedures

Our online ethnography involved an OCS of a SpEd class at St. Therese Learning Center of QC. (STLCQC). STLCQC is a 40-year-old private educational institution that offers programs in preschool, elementary, junior high school, and special education. During the COVID-19 pandemic, all its programs shifted to the online setup. As of writing, the institution now offers blended learning and purely online modalities for general and special education. For SpEd classes, the number of students is kept within the range of six since the learners have specialized needs. The chosen class named Rosas[1] was an inclusive secondary-level class with six (6) students whose academic capabilities were on a similar academic level. They were specifically selected for reasons of availability, compatibility of schedule, and the involvement of all RSGs in using an OCS.

[1] *The name of the section was changed to protect the identity of the participants.*

We observed four (4) 45-minute classes through synchronous sessions held at ClassIn, which served as the school's video conferencing platform, having both authors serving as direct observers and note-takers for the whole duration of the class. We also took note of conversations made in the section's Facebook group chat. During synchronous classes, we separately worked on our notes to ensure that we captured different aspects of ongoing activities. We consolidated our observations afterward. We then interviewed the class teacher and two sets of parents of the CWDDs, with each of us taking turns to ask questions, take notes, and record the meeting as per the participants' consent. We scheduled the interviews at the convenience of our research participants, lasting between 60 and 90 minutes. In response to ethical concerns, interviews with CWDDs were not conducted due to their developmental limitations and mental vulnerabilities.

Private communication platforms were not accessed and observed (e.g., Facebook private messaging, emails, and FNet) to respect their privacy. We also did not directly involve ourselves in the activities of CWDDs to avoid potentially harmful actions during observations, which may affect the CWDDs' mental state and learning process.

Data Analysis

The data analysis phase of our study was thematic and iterative (Galletta, 2013). Our iterative process entailed continuous revisiting of the collected data and proceeding with data construction until we achieved data saturation.

We first transcribed the interviews in clean verbatim format. Then, we substituted all participants' names with pseudonyms to protect their identities. For each interview transcription, we individually wrote memos to describe participant insights and generate meanings from them. For our observation notes, we treated similar observations as concurring arguments to the patterns we observed through the sample's OCS, whereas varying notes were further discussed and elaborated on to arrive at an agreed-upon contextual clarity.

We then proceeded to consolidate our interview memos with our observation notes. We juxtaposed what we observed from the interactions during class hours with the responses of the interviewees regarding the routine of their children before, during, and after classes to acquire a holistic account of how a school day is spent. After the preliminary thematization, we incorporated ideas and findings from relevant literature into such themes to strengthen arguments.

The conceptual progression of our themes was always anchored to the accuracy and context demanded by the study's problem and objectives. We formulated themes for each objective with varying justifications. For instance, the working themes for the first objective adhered to the principle of capturing RSG-specific nuances up to their most basic level. The themes for the second objective constituted similar and distinctive observations from the multiple mediated social interactions we gathered from various RSG pairs. Lastly, the third objective's themes frame an OCS as a flexible digital environment to resolve issues and address concerns. We then thoroughly reviewed the implications of our study to ensure that our findings were conceptually congruent with the assumptions of our objectives.

Results and Discussion

The presentation of findings has four parts: first, we discuss how all three groups use an OCS for the learning of CWDDs; next, we characterize the relationships of the RSGs within their OCS; we then describe how an OCS is harnessed in resolving issues of online learning; lastly, we present our assessment and suggestions for better utilization of an OCS in the online learning of CWDDs.

The five platforms of an OCS used in the class are Facebook private messaging, Facebook

group chat, FNet (the Learning Management System of the participants), ClassIn , and email. In some cases, Zoom was used as an alternative or backup when the class had difficulties with meeting through ClassIn.

1. An Online Communication System for the Learning of CWDDs

We found that participants used an OCS in congruence with its conventional or intended uses. Even though we documented various usages per RSG, such were ultimately not peculiar to the findings of the extant literature.

For Teachers

The teachers of the virtual SpEd classrooms mainly used an OCS for administrative matters. An OCS then functioned as a toolbox for educational guidelines and a gateway for classroom adjustments.

OCS as a Toolbox for Educational Guidelines.

Teachers, as stewards of education, relayed class-related information to parents and students through an OCS. They use an OCS to provide preparatory instructions before synchronous classes and asynchronous activities. Teacher Andrea Ocampo[2] shared that she created a Facebook group chat for parents and students before the academic year started. She added, "*doon [sa group chat] ko muna binibigay 'yung instruction ko for the parents before sila mag-proceed sa FNet.* [I give my instructions for the parents in the group chat (GC) before they proceed to FNet.]" The class GC is also used for clarifications about class-related events or homework instructions. In some instances, she distributed the students' grades and Individualized Education Programs (IEPs) to parents through email, assuming that emails were formal and confidential.

During synchronous classes, an OCS allowed teachers to directly guide the students in learning. In our third class observation, Teacher Andrea used several features of ClassIn, such as share screen and annotation, in overseeing a class activity. She would scribble some guiding marks (e.g, circles, underlines) over her lecture decks to maintain the sensory focus of her students as she discussed pertinent ideas about *uri ng pangungusap ayon sa kayarian* [kinds of sentences according to structure], which was their lesson for that day. Her rule on keeping cameras turned on helped her know if students were still paying attention. Maintaining student attention through immediate communication is crucial in teaching CWDDs.

An OCS is thus similar to a toolbox housing various platforms the teacher can use at her discretion. We found a similar interpretation of an OCS on high school distance education practices, wherein social media and email are treated as support tools made available for advising students, reinforcing concepts, and responding to inquiries (Crouse et al., 2018).

OCS as a Gateway for Classroom Adjustments.

Teachers also used an OCS to adapt to the needs of parents and students. We observed that Teacher Andrea repeated discussing a topic for two sessions because the students could not keep up. She also mentioned in the interview that she would use the video conferencing platforms for simulation purposes. *"Since kami today is nasa ClassIn na... From Zoom to ClassIn, ang ginawa ko muna is nagbigay ako, nagkaroon ako ng schedule for simulation, which is… mine-message ko muna 'yung mga parents, binibigyan ko sila ng… specific instructions on how to enter, para mas mapadali sa kanila 'yung pag-enter sa class.* [Since we are in ClassIn today…I created a schedule for simulation of transferring from Zoom to ClassIn, which I conveyed to parents prior to this. I give them specific instructions on how to log in so they can easily enter their synchronous classes.]"

This specific context shows how an OCS became a way to train parents and students with their synchronous classes. Retrospectively, this has become an avenue to create and assess the

[2] *The names of all research participants were changed to protect their identity.*

aspects that had to be adjusted for section Rosas. Whenever parents struggled with navigating an OCS, Teacher Andrea held synchronous simulation sessions for them. As reported in a study on online SpEd educators, teachers exert more effort in explaining to parents the basic skills and concepts of technological tools necessary to guide them in assisting their children in learning (Crouse et al., 2018).

For Parents

Parents of CWDDs used an OCS to be regularly aware of their children's learning progress. Specifically, they used their OCS as an available hotline for class-related concerns and a mailbox for progress monitoring.

OCS as an Available Hotline for Class-Related Concerns.

Whenever they had the time, parents generously used an OCS to communicate their concerns to the teacher of the class. They treat an OCS as an always-available line of communication with the teacher. Teacher Andrea says, "*May times na hindi lang private message (PM), nagko-call din sila kapag urgent din talaga 'yung mga questions nila na parang kailangan nila ng sagot.* [There are times when parents call to ask questions that need immediate answers.]" Her account of parents' use of an OCS reflected the notion that integration of technologies in the classroom gave parents open access to the teacher with amenable time arrangements (Smith et al., 2016). Likewise, an OCS is boundless because it archives class-related instructions. Such is the case for Mrs. Anna dela Cruz who explained that *"Una, iche-check muna 'yung mga messages [sa group chat], kung mayroong link na ibibigay 'yung teacher, e 'di magjo-join na siya sa Zoom meeting nila.* [First, we will check previous messages in the GC to see whether a meeting link was already given, or a new one will be provided; after which we will join their Zoom meeting.]" Mrs. Jocelyn San Juan also relied on the group chat for matters she might have missed or forgotten. Since class group chats retain what was shared through them unless removed, parents can backtrack the messages anytime (Insorio & Olivarez, 2021).

OCS as a Mailbox for Progress Monitoring.

For more personal concerns, such as revisiting IEPs and negotiating concerns on requirements or student grades, parents depend on an OCS to communicate with teachers. Our observations agreed with the practice in a DE setup where parents have the right to be informed of their children's low academic performance (Crouse et al., 2018). In this case, however, parents seemed to be active enough to monitor their children through the synchronous sessions and various platforms of an OCS. For Mrs. San Juan, progress monitoring was most resonant in the usage of Facebook group chats, which then served as a mailbox of questions related to the academic advancement of their children. *"'Yung status no'ng activity no'ng mga anak sa klase, 'yun lang naman madalas napag-uusapan sa GC eh, Na-submit ba 'yung project on time, nakuha ba ng bata 'yung topic nila.* [The status of our children's class performance is often talked about in our GC—whether the projects were submitted on time and whether the child was able to understand the topic.]"

Furthermore, since some parents watched and assisted their children during synchronous classes, they indirectly used an OCS as an observation tool. This interpretation was captured in Teacher Andrea's experience when a parent overheard her discussion and messaged her privately to correct what she had taught. Thus, while parents essentially acted as silent witnesses in the synchronous sessions, they voiced their concerns in the different messaging platforms later—particularly through private chats.

For Students

Students displayed a practicable sense of agency to use an OCS as a playhouse for agentic exploration and a wall clock for context-setting, as discussed further in subsequent paragraphs.

OCS as a Playhouse for Agentic Exploration.

Like children enjoying their independence in a playhouse, students are given considerable freedom in using an OCS. In the third session that we observed, Rosas students Sharlene and Jayden casually requested Teacher Andrea for the crown (a feature akin to the co-host privilege of Zoom) to be able to annotate for recitation. Indeed, these instances agree with synchronous learning sessions as sites for teacher-student collaborations (Perveen, 2016). One parent, Mrs. Dela Cruz, also pointed out that she allows her son to submit his assignments on his own. "*Tinuturuan ko siyang i-convert sa pdf ['yung assignment niya], tapos tinuturuan ko siyang mag-upload.* [I am teaching him to convert his assignment to a .pdf file and to upload it.]" These first-person accounts demonstrate that children's autonomy in using an OCS starts to be cultivated at home.

Owing perhaps to the novelty of their OCS features, students also acted on their curiosity to use platforms unrelated to the discussion. While explaining onomatopoeia, Edward, a Rosas student, sent a " 😊 " emoji to the chat room of ClassIn for no compelling reason. Such an instance resonated with an earlier finding that students are inclined to have off-topic discussions than required forum exchanges (Hou et al., 2013). However, it was also explained in more recent investigations that the inclusion of emojis in a message is primarily an affective mode of interaction for students with disabilities in online learning settings (Stevens & Rice, 2016; 2018). Hence, more than an innocent exploration of a platform's features, Edward's message can also be read as an expression of an intention to foster a feeling of connectedness or convey his desire for Teacher Andrea's attention.

OCS as a Wall Clock for Context-Setting.

Although students could use an OCS anytime, our findings suggest that they only used it to seek class-related clarifications during or about synchronous classes. Similar to a wall clock, checking or using an OCS usually provided context on how a student's day or agenda would be planned or carried out. In a synchronous class session, Anton seized the remaining class time to inform Teacher Andrea that they would be absent the next day because he was up for vaccination by then. Interestingly, students only brought up immediate concerns about submissions or activity instructions during synchronous classes. This time-bound concept of an OCS by students stems from the capacity of synchronous sessions to allow both teachers and students to coexist in a virtual space, thereby implying immediacy in feedback and issue resolution (Perveen, 2016).

2. Relationships Within Rosas' Online Communication Systmen

We further inquired how these groups formed relationships within their OCS to know the roles RSGs partake in the online learning of CWDDs. While these relationships are replete with subtexts and nuances, it can also be posited that the negotiation of meanings within the classroom is shared. We elaborate on each dynamic in the ensuing sub-findings.

Mirrored Representations: The "Communicative Oneness" of Parents and Students

Parents and students function as a singular communicative entity in their OCS. Teachers should share information with both students and parents. We thus frame parents as alter egos of the students; any information relevant to them alludes to the parent. Their oneness then makes them a singular force that can affect the norms and accepted capabilities of the online classroom.

In a synchronous session where Teacher Andrea had an assistant teacher, she told the latter that their next synchronous class would be post-poned and that parents should be informed about it after their session. Mrs. San Juan, on the other hand, expressed that she always reminded her daughter to be presentable and prepared before entering the synchronous class session. She

understands that her daughter's appearance in every session reflects her parental capacity.

Similarly, this oneness is crafted gradually where the parent-student relationship becomes a trainer-trainee relationship. Mrs. Dela Cruz shared that she was still guiding her son to use the laptop and applications like Microsoft Word until he became independent in his online classes. This finding concurs with the documented role of parents in distance education as assistant facilitators who structure lessons and implement teacher-suggested interventions (Smith et al., 2016).

Heeded Authority: The "Empathetic Formality" of Students and Teachers

The teachers are not stern figures of authority in the virtual classroom. Although they establish formal boundaries for communicating with students, they are nonetheless considerate to them. A student-teacher relationship can be best summarized as walking side-by-side: it is characterized by close-to-direct guidance, where teachers patiently support the students whenever necessary. This kind of relationship is very much captured in Teacher Andrea's words: "*Dito sa aking Rosas…mas ine-entertain ko muna 'yung mga magagaling din para maging example sila no'ng mga students na medyo nahihirapan sa subject na 'yun.* [Here with my Rosas class, I first entertain those who excel on a particular subject to set an example to those who are struggling.]"

However, the formality that surrounded interactions with the teacher resulted in a lack of personal conversations. When asked whether students formed a personal bond with her, Teacher Andrea responded in the negative. Her communication with her students on private messaging and group chat is limited to class-related queries or administrative matters only.

Sustained Collaborations: The "Proximal Conversations" of the Teacher and Parents

Parents have acquired a more personal footing with the teachers than their children due to frequent personal interactions, as also observed by Teacher Andrea. Parent-teacher interactions are said to be frequent in distance learning of CWDDs because parents are crucial in the learning process (Cahapay, 2024). As parents had to play the role of the "educator", they needed to collaborate with the teacher by maintaining constant communication. However, these formed proximities that we documented were still bound by limitations set by the teacher.

Teachers also functioned as the perpetual end of all communications made within an OCS. Mrs. Dela Cruz quipped that students' default mode is "business as usual"; they only communicated with the teacher. She also said that students were mere acquaintances of each other. Analogously, Mr. Dela Cruz disclosed that even parent-parent interactions barely took place. These isolated interactions may hinder CWDDs from maximizing their learning capabilities, as socialization is integral to a holistic approach to distance education (Valliulina & Fedotova, 2016). Thus, further issues on the students' holistic learning may still be engendered.

3. Resolutions in Rosas' Online Communication System

To further understand the participants' social construction of an OCS, we looked at how the RSGs resolve technical, behavioral, and participatory issues in an OCS. Our main finding is that they arrive at a mutual agreement by developing mechanisms anchored to a perceived "common good". This common good was usually geared towards the harmony of all participants in the classroom, as well as the subsistence of classroom activities every school day. Thus, an OCS has become a zone of discourse for the participants to address their concerns and create an active learning environment where RSGs are involved with each other's progress. Below are the most prominent uses of an OCS in the realm of resolving conflicts:

OCS as a Complementarity-Driven Domain

An OCS works within the framework of complementarity to facilitate social interactions that intersect with the needs of all RSGs. In the case of Rosas, RSGs often combined commonly used social networking platforms and specialized educational tools as a response to issues of accessibility, literacy, and technological capacity.

Facebook is one component of an OCS that the participants find very useful. For example, students accepted Teacher Andrea's use of Facebook Messenger as a security mechanism while confirming the accuracy of the students' learning progress: "*Sa PM, kapag may mga quizzes ako, may mga activities ako, pinapa-send ko sa kanila before kami magche-check. Kasi, gusto ko rin na alam nila na hindi sila puwedeng mag-cheat din kasi nakita ko na 'yung answer nila.* [Whenever I give quizzes or activities, I let them send such outputs privately before we check synchronously. I want them to know they cannot cheat because I can see their answers.]" Parents also highlighted the salience of Facebook's inclusion in an OCS as they cited its accessibility and familiarity. Mrs. San Juan added that she largely used Facebook group chats in daily communication: *"Malaking bagay siya…hindi lang sa online learning. 'Yung sa GC ng mga friends mo, napakalaking bagay e, 'di ba? Na kahit malayo ka, through that platform, nagiging parang malapit, [nagiging] posible?* [It really is very important not just in online learning. It can also be used for your friends' group chats, which makes it so important, right? Even if you are at a distance, through that platform, it seems like you're bound together. It all seems so possible.]"

Within Facebook's slew of affordances, Facebook Messenger has proven to be an OCS component that the participants are comfortable using. Facebook Messenger also redefined ClassIn's purpose from a multi-featured communication platform to a mere video conferencing medium. As Teacher Andrea shared, ClassIn has a lot to offer for the facilitation and conduct of online classes as it has built-in messaging platforms and various applications that help in achieving a fun-filled class. However, since she is administering a SpEd class which should involve more RSGs in the usage of an OCS, the collective learning curve for ClassIn becomes steeper, thereby ushering in the reliance on more familiar complementary applications.

Here, we can see how some specialized tools are restrained from their potential utilization while the simpler platforms are pushed to their limits. The decentralization of communication in a singular application then affirms that the stabilization process of an OCS is resolved through a recalibration of platform usage permutations.

Interestingly, synchronous sessions were also found to be stabilized using platform backups. The complaints about Zoom's inconvenient entry to a meeting room and limited duration (in free accounts) were resolved with the introduction of ClassIn as the new video conferencing medium. However, ClassIn is not perfect in itself—and in cases where technical issues arise in the said platform, Zoom ironically returns as a backup plan for stabilization. For Teacher Andrea, stabilization can be best achieved when the problem is redefined from a lack of technological competence to a lack of creativity in usage, saying "*Kay ClassIn, kapag nagkakaroon kami ng ganoon na hindi lahat nakakapasok, pinapalipat ko actually sa Zoom. Kasi, parang sayang din 'yung oras. [When some students cannot enter ClassIn, we transfer to Zoom because it also is a waste of time.]"*

The social construction of an OCS then lies in mixing and matching different applications to achieve a specific result. This three-part component of complementary platform usage (literacy, accessibility, and technological capacity) was also empirically observed in various studies that emphasized the role of technological affordance and perceived difficulty in utilizing different communication applications (Avram, 2015; Mokhtar

et al., 2018). Unlike other studies that pointed to the teacher's technological capacity (or lack thereof) to handle complex features (Machajewski et al., 2018), Rosas' platform management capability is shared. The dynamic in their OCS then balances the complexity and immediacy of social interactions to achieve efficient communication among all RSGs.

OCS as a Collaborative Inquiry Hub

An OCS is established as a hub where all RSGs (may it be a teacher, parent, or student) can respond to queries from one another. One study attested to such operation of platforms as it grouped students and forged "problem-solving communities" in the online learning setup to collectively resolve class-related issues (Heinze & Procter, 2006). Our findings showed that the same might be applied even with the presence of parents. As observed in the class group chat, parents did not shy away from extending a hand to those who needed assistance in on-topic conflicts. Mrs. San Juan briefly shared that other parents would initiate answering questions they know the answer to in the group chat.

This glimpse of responsiveness to transactional teamwork is where RSGs draw strength to attain a common goal (Williams, 2010). Furthermore, it helps avoid "hanging uncertainties" where conflicts are left unresolved due to the absence of the teacher in educational processes (Huang, 2018). Such collaboration among participants to answer questions is said to be beneficial for CWDDs because it helps them overcome limitations that may affect their academic performance (Dianito et al., 2021).

Of course, the collaborative inquiry hub is also rooted in the desire to attain immediacy of feedback. The notification feature of a platform then is principal to enacting an efficient response system. This reasoning was expounded by Teacher Andrea and is affirmed by another study, which posited how Messenger's automatic notifications update students promptly, thereby augmenting students' engagement in virtual discussions (Hou et al., 2013).

Given the intricacies of constructing a collaborative inquiry hub, Teacher Andrea found simulations necessary to disseminate sufficient information about the basics of the platform. Consequently, this decision equips an OCS with fairly knowledgeable participants who may help one another without her omnipresent supervision. Thus, her interpretation of an OCS as a "time-bound" site triumphs over the parents' perception of the platform being a boundless hotline.

OCS as an Amendment-oriented Zone

As seen in the previous themes, the stabilization process is never truly stable; thus, RSGs continuously reconstruct the system to ensure that the communicative environment is beneficial for all involved participants. Indeed, RSGs share the power to propose amendments based on their observations. One study also affirmed this observation of a shared power of teachers, parents, and students in managing the class (Tindle et al., 2015). Moreover, systemic amendments, although involving the welfare of the majority, were communicated privately by parents. Mrs. San Juan shared that parents or students conveyed to Teacher Andrea through private messaging the other participants' disruptive behavior in the video conferencing medium.

Both Mr. and Mrs. Dela Cruz explained this preference for privacy in congruence with the group chat's *hiya* (shame)-driven culture. Hiya is a Filipino value that implores an individual to actively and consciously contain themselves from embarrassing or damaging the ego of the other (Bulatao, 1964; Martinez, 2019). The lack of social cues in the group chat may cause the tone of the message to be interpreted subjectively and, in the process, be misunderstood by other chat members.

Since teachers and parents socialize better through private messaging, there is a sense of

comfort in being direct. Teacher Andrea recalled an incident that made her more cautious about her teaching process:

> *May times actually na na-encounter ako na kinorrect ako ng parent sa topic na tinuro ko…Kapag ganoon naman, inaamin ko naman 'yung fault ko tapos nagso-sorry ako sa parent. Then, the next day, ika-clarify ko na sa kanila na ganito 'yung tama. And mag-a-apology din ako sa mga student.* [There was a time when a parent corrected me regarding a topic I was teaching. In such a case, I always admit my faults and apologize to the parent. Then, the next day, I will clarify the correct information to them. I will apologize to my students as well.]

Based on this account alone, one could already see that Teacher Andrea is open to class improvements; an OCS then serves as a zone where amendments are made methodically. Here, private messaging is the principal platform of conflict negotiation, while the video conferencing medium is the site for resolution-application.

Meanwhile, students were not deprived of proposing amendments—albeit articulated less directly. Students proposed amendments with directness and immediacy. Interestingly, it is in this power to grant flexibility of learning amongst students that educational processes are made versatile (Basko & Hartman, 2017). Ultimately, an OCS served as a haven for open discourse that negotiates how communication should be carried out in the virtual classroom.

OCS as a Value-Laden Milieu

For the RSGs, an OCS is not a value-free milieu that focuses on content and interaction. Instead, the RSGs mutually decided what values they should ascribe to each platform. Teachers, who are often authority figures in synchronous sessions and collaborators with parents on messaging platforms, practiced a system of reorientation. This system allows any participant to reorient a peer who diverges from the established norms about class guidelines.

Furthermore, these norms on class behavior were derived from the expectations in face-to-face interactions (see Ersoz, 2019). For Teacher Andrea, the group chat was similar to an in-person group conference, which explains why she was projecting a tone of formality in her messages. Ultimately, the rhetorical closure of the value-laden OCS is reflected when participants self-regulated in observance of the ascribed norms. Our participant observations reveal that students have learned to mute themselves in ClassIn whenever their audio transmitted background noise. Compared to other findings that reinforce speaking up as a means of communication, the goal here is to forge a "silent authority" that facilitates behavior in the milieu.

4. Proposed Amendments in Harnessing an OCS

After employing SCOT in assessing how RSGs utilize an OCS in online learning, we formulate recommendations to recalibrate the usage of an OCS. An OCS must be socially constructed in a way that would maximize the specialized tools available and proactively avoid any misunderstandings in the future.

INTEGRATE: Recalibration of Platform Usage

An OCS prioritizes the complementarity of platforms to advance online learning efficiently. However, we saw an issue with the multiplicity of platforms that had to be harnessed in addressing class-related concerns. In retrospect, a study already saw the lack of immediacy as a disadvantage of establishing conversations in emails (Palts & Kalmus, 2015). Moreover, the RSGs affirmed that using emails was sporadic and optional—perhaps almost invisible in the time-bound nature of synchronous sessions. Thus, we deem it beneficial to dismantle the emailing platform as a pertinent channel of an OCS.

Although RSGs delegated emailing as a platform for attaching large and confidential files, FNet also offers such a feature. This is because FNet provides a formal messaging and file uploading feature, which can thus be in lieu of emailing. Interestingly, one study saw that the Learning Management System (LMS) and better communication with teachers had a positive relationship, thereby supporting our proposal of platform integration (Yavich & Davidovitch, 2021). Then, the LMS can be an engaging educational platform in synchronous sessions with its rich features, particularly in examinations (Moreillon, 2015).

Of course, we also consider the possibilities of integrating an OCS into a singular platform—especially after Mrs. Dela Cruz expressed her interest in such a development. Ergo, in crafting proposals to improve an OCS, we had to balance the maximization of features and consideration of RSGs.

CONSULT: Centralization of Class Consultations

Through participant observations, we observed the rather subconscious usage of ClassIn as a consultation platform. Although parents served as representatives of students in asynchronous inquiries, students still opted to assert their agency in synchronous classes by bringing up some clarifications and concerns about their class participation. After the formal session in their Math class, for instance, Anton requested some leeway for the deadlines since he would receive vaccination the following day.

This preference for synchronous consultations may be due to their effectiveness in clarifying matters compared to asynchronous and blended approaches (Moallem, 2015). Hence, having a formal consultation session daily will help create a safe space to bring up concerns without interrupting the class flow. Literature reported that homeroom sessions contribute to a positive classroom climate and open opportunities for students to better connect with other RSGs (Ito, 2011; Liu & Barnhart, 1999; Wu et al., 2015).

In response to the practical non-existence of pre-class consultations (Bestiantono et al., 2020), we deem it most beneficial to craft a homeroom session before the start of formal synchronous classes. In line with this, we recognize the additional burden these sessions may inflict on the teacher; thus, we recommend that RSGs craft guidelines regarding homeroom sessions that would best benefit them. For example, teachers may be given the privilege to conduct asynchronous homeroom sessions at least once a week to reduce their synchronous load. We also recommended holding optional clarificatory sessions on the last subject in case some last-minute matters have arisen within the time frame of the formal classes.

INTERACT: Cultivation of Holistic Learning

As affirmed by the RSGs and observations, students do not have any personal relationships with each other; their conversations are mostly class-based. This practice opposes the viewpoints of parents and teachers who want students to be as self-sufficient and skilled as possible. Thus, the class should create another group chat where students can casually converse and cultivate relationships with each other (see Hou et al., 2013).

This initiative for peer-mediated interaction is said to generate positive results among people with autism spectrum disorder, especially when grouped with students who are at par with their skills and limitations (Watkins et al., 2014). Accordingly, one study also nodded to the inclusion of Facebook group chats as they contribute to greater inter-student engagement and the general development of students' social skills (Marteney & Bernadowski, 2016). To aid in including students with reading difficulties and addressing discriminatory concerns, we encourage using the "voice message" button when interacting within this casual group chat for CWDDs.

Since all students are still minors who need guidance from adults, we would like to propose a system of "supervised independence" where the

group chat remains student-centric but is still overseen by an adult. This is to better guide the navigation of children in the given virtual environment, particularly as they may be susceptible to privacy and app usability concerns (Ekambaranathan, 2022; Sianturi et al., 2019). We do recognize, however, the additional work that the adult supervisor will be having. Thus, we highly encourage volunteers among parents and teachers to assume the said role.

Furthermore, this said chat should also be created in a child-friendly app with messaging affordances. As such, we postulate that ClassIn's group messaging function, which was not utilized by the RSGs at the time of data generation, be harnessed for the interaction between and among students.

Conclusion and Recommendations

Our findings discuss how teachers, parents, and CWDDs utilized an OCS for online learning. We found that all RSGs have their purposes for using an OCS, which agreed with the extant literature. They negotiated these purposes with others as they built relationships within their OCS. Should conflicts arise in such negotiations, an OCS is reconstructed until all parties accept the new terms provided in using it. In summary, we are able to affirm the theoretical tenets of SCOT in the local context. However, we acknowledge that the social construction of an OCS is still ongoing, and it will take years for the RSGs to achieve closure in an OCS as a medium for online learning.

Our study recognizes the struggle that CWDDs bear in transitioning to a virtual setup where technology is attempting to compensate for the lack of in-person pedagogy. Foreign literature, for instance, reported that many CWDDs did not receive sufficient support in executing learning activities and communicating their concerns during the DE setup of the COVID-19 pandemic (Verulava et al., 2022; Yazcayir & Gurgur, 2021). While most classrooms struggled to foster an ideal setup at the time, the sudden shift to DE was particularly excruciating for inclusive classrooms; a fact that still warrants further amplification through future studies. The need to address the special concerns of CWDDs, along with the increased need for parental involvement, made communication a more complex process for all RSGs as emphasized in our study.

As an OCS proved to be an accessible and adaptable means of resolving conflicts in the classroom, we then provided suggestions derived from a social constructivist assessment of an OCS used in the Rosas class. To begin with, emails should be dismantled from their OCS as FNet can also serve its function. Likewise, we consider maximizing all the features of FNet in holding synchronous activities or quizzes. In response to interruptions brought by urgent clarifications raised before class sessions end, we recommend allotting a homeroom session before the start of formal synchronous classes. Lastly, to provide opportunities for socialization, we suggest creating a class group chat under the supervision of an adult where students can casually interact.

For our recommendations, our findings reveal that Filipino values may manifest in the communication of RSGs in an OCS. As such, we recommend integrating Sikolohiyang Pilipino as an ancillary framework in future studies to extract a more in-depth explanation of the RSGs' social construction of the involved technology better.

On the other hand, we also suggest the study be conducted on a larger scale to present a more accurate representation of an OCS in the virtual learning environment. Likewise, we deem it beneficial to stretch participant observations for at least a whole school year. Lastly, we recommend that future researchers conduct a focus group discussion with the administrative teams of the chosen schools, along with experts in SpEd and Information and Communication Technology (ICT). Their participation is critical to bolster the study's data interpretation and craft informed propositions in harnessing an OCS for online learning.

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