

# UNDERSTANDING DUOLINGO DISCUSSION BOARDS AS SOCIAL-EMOTIONAL SUPPORT DURING THE COVID-19 PANDEMIC

Tom Neuschafer, Foreign Languages, Jersey Shore Area School District

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## ABSTRACT

*Language learning programs had been affected by declining school budgets and state support well before COVID-19, but the pandemic exacerbated the already declining learning outcomes of students. Duolingo, a free language-learning app, provides a platform for users to learn language skills using activities and exercises for over 38 languages. Duolingo users are not limited to language-related topics and can often venture into topics that explore these socio-emotional spaces. This study examined how Duolingo discussion board users have been affected by factors related to the COVID-19 pandemic. This study used a netnography methodology within a qualitative study design to examine how the COVID-19 pandemic might be associated with perceptions about foreign language learning on Duolingo. The sample size of the current study was 20 discussion boards out of a total of 3,464 across a sample of 38 language courses available on the Duolingo platform. Examining Duolingo's asynchronous discussion boards, findings presented three themes among users, including community, generosity, and gratitude, as well as information-seeking about COVID-19-related vocabulary and phrases. The pandemic has affected language learners' emotional conditions, which motivates further research to examine ways in which learners can share their experiences, vent about their difficulties, and build community connections in a safe, virtual setting.*

**Keywords:** *Online language learning, COVID-19, discussion boards, user experiences*

The COVID-19 pandemic has created many educational challenges for learners and instructors. These challenges are especially salient for teachers who quickly pivoted from traditional, face-to-face classroom settings and struggled to design appropriate courses, effective assessment strategies, and experiential learning opportunities in the new online learning environment brought on by the pandemic (Withers et al., 2021). Furthermore, Withers et al. (2021) interviewed instructors across a broad range of universities and identified several themes regarding topics most pertinent to virtual learning during the pandemic: Ideas for online and remote assessment; authentic experiential

education; building community; technology for remote learning; equity and access in remote learning; and supporting learners. The authors also found that instructors were concerned about how to “build a learning community and social presence... [and] create ongoing opportunities for cognitive presence in a remote learning environment” (p. 44). Similarly, the instructors discussed concerns about challenges regarding equitable and inclusive remote learning environments (Withers et al., 2021).

Language learning programs were affected by declining school budgets and state support well before COVID-19, but the pandemic exacerbated

the already declining learning outcomes of students (Jackson et al., 2020). Back et al. (2021) found that language learning and teaching have been given even lower priority after the start of the COVID-19 pandemic, leading to diminished attention to world language as an important educational subject. Back et al. (2021) also described feelings of disconnection and decreased engagement among both language teachers and students. However, adaptive learning technologies, which have become more prominent during the COVID-19 pandemic, may present opportunities for teachers to use contextually feasible, low-cost, online supplemental tools that can better support and broaden traditional classroom environments to reach more students. Discussion forums may serve as an additional support system to those pursuing virtual learning because of opportunities to connect to similar individuals who are also experiencing problems that may arise while learning during the COVID-19 pandemic.

Duolingo connects learners through asynchronous discussion boards, facilitating many learning communities. Asynchronous discussion boards allow users to reflect and respond in their own time. Duolingo is a language learning app where users can create a free account and choose a language to learn. Users progress through the levels of learning a language through lessons, activities, quizzes, and games. A feature of Duolingo that users enjoy is the gamification elements. As in many online games, users begin their learning process with a set number of lives, which are depicted as heart icons. Users lose hearts when they answer an item incorrectly. A total of five hearts may be subtracted when a user gives an incorrect answer, making it more difficult for average users to progress. When a user has lost all their hearts, their session on Duolingo ends for the day (Duolingo, 2021). Many users are attracted to this gamification and design of the language learning application.

The Duolingo app is a free language-learning app (LLA) that provides a platform to learn language skills using activities and exercises for over 38 languages. Specifically, the language learning app Duolingo may offer these benefits to online language learners, creating a pathway to the development of improved language acquisition skills. Unlike many traditional educational systems, which were unprepared for virtual learning (Withers et al., 2021), Duolingo had the

technological infrastructure to support online learning well before the COVID-19 pandemic. The various types of users on the platform include average users, plus users, and moderators. Average users learn the language on the free version of the program, while plus users pay an additional fee in exchange for more features. For example, plus users do not have to see or listen to ads and can continue working even if they run out of hearts (i.e., attempts to answer a prompt correctly). Moderators are volunteers who have received a special invitation based on their demonstrated proficiency in the target language. Compared to basic user responses, moderators are able to answer questions and lead discussions in the discussion boards more reliably.

Another educational benefit to using the LLA is that Duolingo's approach is based on scaffolding, or educational lesson planning. In this study, scaffolding refers to learners' progression into more advanced Duolingo levels once they have shown that they are competent at the previous level (Wood et al., 2007). Duolingo may advance users to higher levels by recording their incorrect answers. If an average user has five incorrect answers during a study session, they are not allowed to continue on the app until their hearts recharge. The user must answer items correctly before they are able to complete the new material, which is aligned with the scaffolding theory. Duolingo uses negative feedback for the user to identify incorrect answers, which provides information that the user may use to learn from their mistakes in the future. Specifically, students have to display proficiency in common words and phrases, the enunciation of speech, and echoing. Scaffolding in Duolingo may serve to help learners achieve specific learning goals because it groups content together into manageable units (Yakaeva et al., 2017).

According to Bende (2017), one advantage of using Duolingo compared to face-to-face language instruction is that the program is gamified, meaning that game mechanics are built-in to create learning incentives that may motivate students to progress to advanced levels more quickly. The Duolingo web version and mobile application allow users to earn and redeem lingots, a currency within Duolingo that can be used to buy bonus skills, power-ups, streak holders, and tests to skip to the next level (Duolingo, 2021). In addition, the Duolingo program incorporates leaderboards,

badges, and progress boards that may facilitate a sense of competition among users, especially if they participate in community-centered features such as asynchronous discussion boards. Gamification may be particularly attractive to today's learners who have grown up immersed in technology and whose social, educational, and entertainment lives have been centered on using virtual media platforms (Neuschafer, 2021).

Duolingo users may also use community-based sources of information exchange on its asynchronous discussion boards. Ferdiansyah et al. (2020) interviewed remote learners and reported three central themes involving agility in adapting to online learning environments, ability to sustain learning motivation, and strategies to increase autonomy. The study found that many students relied on friends, teachers, and parents to provide emotional and mental support to navigate these issues (Ferdiansyah et al., 2020). However, faculty at traditional universities found that they lacked socio-emotional competencies to maintain continuity with student-peer and student-instructor relationships (Lloyd-Jones, 2021). On Duolingo discussion boards, users can come together to problem-solve vocabulary and grammar issues, troubleshoot technical aspects of the program, and discuss additional resources for language content. However, discussions on Duolingo are not limited to language-related topics and can often venture into topics that explore these socio-emotional spaces. One single discussion board may remain active for several years at a time, as users connect longitudinally to ask questions that may help them further advance in their language courses (Duolingo, 2013). The learners may use asynchronous discussion boards to post comments and queries and to offer their advice to other users related to the tools or curriculum. By examining asynchronous discussion boards, the researcher analyzed how Duolingo users were adapting their informal knowledge acquisition related to foreign language learning during the COVID-19 pandemic. COVID-19 forced many businesses, professions, and academic institutions to offer their services online (Bussin & Swart-Opperman, 2021). Throughout the COVID-19 pandemic, discussion boards among online platforms were utilized by individuals seeking social or emotional support (Yildirim et al., 2021). For example,

health care organizations began offering support groups and discussion boards to members (Lu et al., 2021). K-12 institutions began offering discussion boards to students as a platform to support social and emotional concerns as well (Yildirim et al., 2021). Many foreign language educators used online learning platforms to engage with their students (Khoshnevisan & Rashtchi, 2021). Burgo (2022) shared how students sought emotional support while in their learning platforms. The benefit to using online platforms for language learning was the fact that users could get quick responses and feedback to their questions or comments. Many educators and language learners turned to Duolingo and an online educational supplement, which presented users with access to other learners through discussion boards (Kirange et al., 2021). The objective of this study was to examine how students used the discussion boards of Duolingo to look for and offer social support during the pandemic. Specifically, the current study answered two research questions: What topics have learners perceived as important on Duolingo discussion boards during the COVID-19 pandemic? How are these topics and issues affected by the factors related to the COVID-19 pandemic? By examining Duolingo's asynchronous discussion boards, researchers may better understand how users adapt their foreign language learning on Duolingo to the new realities associated with online learning, particularly during the COVID-19 pandemic.

## LITERATURE REVIEW

Traditional learning programs have faced a multitude of challenges throughout the COVID-19 pandemic, which has propelled institutions to shift toward virtual learning environments (Elzainy et al., 2020; Khan & Jawaid, 2020). Many educators had to quickly adapt to a virtual learning environment for the first time, and the same is true for many students as well. Navigating virtual learning environments presented many hurdles, especially relating to schools' and individual students' technological infrastructure and educators' access to relevant professional development (Withers et al., 2021). Withers et al. (2021) reported that learners have had to demonstrate resilience and resourcefulness in order to obtain high-quality, rigorous, and meaningful educational experiences.

Since even before COVID-19, some public

K-12 schools began to offer remote instruction that allowed for real-time interaction between teachers and learners. However, the expectation that all students would be available to interact and connect with their classmates and instructors often during each course may not reflect equitability and inclusivity. For example, a wider variety of students are able to participate in an online learning setting because of the freedom of being able to type out a response, as opposed to having to raise their hand to speak. Furthermore, a higher number of questions can be answered in a shorter amount of time without competing for temporal constraints (Orlov et al., 2020). As such, asynchronous discussion boards may be an additional learning tool to allow learners to acquire knowledge and foreign language skills easily, which can be challenging when learning in a remote setting. According to the National Research Council (2012), discussion boards can provide students with structured feedback, encourage peer-to-peer learning, and provide opportunities for reflexivity within the learning process. As such, discussion boards may promote a one-directional stream of communication between the Duolingo platform and the learner and may help facilitate learning between Duolingo users.

As aligned on the Duolingo platform, this structure of awards for completion and participation has been shown to encourage responses in asynchronous learning (Withers et al., 2021). Asynchronous discussion boards work particularly well when learners can easily participate with their own timelines and schedules.

Research has shown that education platforms may benefit from asking learners a range of questions about their engagement with the platforms through surveys, including emotional check-in questions; questions to encourage metacognition (Ambrose et al., 2010); questions about course logistics; questions related to how learners feel about a course; questions about which parts of the course are the clearest or most confusing (Angelo & Cross, 2012); questions about additional resources to be used; and questions about students' individual interests in the course. In addition, optimal transitions from traditional classroom settings to virtual environments may be attributed to social support that learners receive from their educational institution and instructors in response to novel, and, at times, difficult technology-based platforms.

However, no research to date has examined the extent to which learners feel strongly about these issues directly. As such, this study sought to fill a gap in this literature by examining the role that social support on Duolingo discussion boards plays in relation to language learning during COVID-19.

### **EMOTIONAL, INFORMATIONAL, AND LEARNING SUPPORT DURING THE COVID-19 PANDEMIC**

Jennings and Greenberg (2009) found that as public health crises and global crises persist, particular skills involving social and emotional competence are important for student learning in addition to the content-related learning outcomes. Since Duolingo users are self-directed and do not have access to instructors, the platform presents an opportunity for learners to provide social support to each other while coping with the challenges associated with the COVID-19 pandemic. Research from human development as an academic discipline can be helpful because it focuses on building connections across various contexts and environments while simultaneously preventing breakdowns of social support during fluctuating social and human events (Bukhari & Afzal, 2017).

According to Albrecht and Goldsmith (2003), navigating one's emotions is more important than the provision of information in academic contexts. The authors found that learners cannot absorb material if they do not acknowledge their anxiety, fear, and sadness in the face of stressful situations. Lloyd-Jones (2021) found that "coaching, care, and collaboration each involve an aspect of the kind of emotional support brought on by the pandemic" (p. 49). Collaboration provides emotional support within a learning community by allowing learners to share experiences and perspectives of predicaments related to COVID-19. Empathy also plays a role in collaboration, as it enhances a sense of community and shared experiences in an effort to reach a shared goal (Lloyd-Jones, 2021). Social support among learners may offer them the emotional strength to overcome environmental hurdles to their learning that developed during the COVID-19 pandemic.

In terms of instrumental support, Lloyd-Jones (2021) found that technical expertise relayed in a learning setting helps individuals navigate the tools, procedures, and processes necessary to execute functions associated with learning via an

online platform. In the context of Duolingo forums, learners can share written protocols for using the technology and other related topics that may interest the users. By sharing instrumental support, learners can reframe their skillsets that may require technical expertise. Informational support can be multi-faceted, offering technical and emotional support simultaneously. According to Lloyd-Jones (2021), instrumental support “can be considered a behavioral response that is entirely technical and at the same time related to collaboration” (Lloyd-Jones, 2021, p. 50). In relation to the pandemic, offering learners various kinds of support can “mitigate the emotional responses... associated with the public-health emergency and anxiety related to the course” (Lloyd-Jones, 2021, p. 50). Chen and Yang (2006) found that the peer-to-peer knowledge that comes with instant communication platforms can build a community of learners that stays connected and informed, maintaining an optimal learning environment.

Learners may check in with one another and offer additional resources that may improve the virtual learning environment experience. As such, emotional support, instrumental support, and informational support are key features of Duolingo that learners can engage with to optimize their learning outcomes in the face of adverse public health emergencies. According to Lloyd-Jones (2021), this dynamic may lead to learners having a “buy-in and motivation to be more productive, resulting in success and high-quality work” (p. 51). Within the model of human resource development, all these forms of support may encourage participation in the online learning environment and allow learners to perceive the environment as having significance in their individual outcomes. When Ferdiansyah et al. (2020) examined students’ experiences of online learning during the COVID-19 pandemic, they found three important themes, including “the agility of student participants to adapt online learning to suit their learning needs, the participants’ strategies to build learning autonomy, and the participants’ ability to sustain their learning motivation” (p. 58). Given the importance of these collaborative and supportive features in learners’ success in an online learning environment, it is essential to understand how learners on Duolingo communicate these ideas on the discussion boards.

## LANGUAGE LEARNERS’ ANXIETY DURING THE COVID-19 PANDEMIC

Mohammed and Mudhsh (2021) examined the effects of COVID-19 on language learners’ anxieties. The authors examined internal factors that may increase anxiety and are related to COVID-19, as well as external factors. Learners experienced anxiety about their language studies, which aligns with the findings that 92% of learners experience overall anxiety during the pandemic, with 22% experiencing severe anxiety in a university sample from Pakistan (Aqeel et al., 2020). As such, Mohammed and Mudhsh (2021) concluded that anxiety has negative effects on foreign language learners, which can hinder their ability to meet performance goals. From these findings, a need to find innovative strategies to promote the mental health of learners during the COVID-19 pandemic was identified.

Learners of a foreign language may also have cultural challenges associated with COVID-19. Krotik and Morhun (2021) found that “the gradual decline of his/her intercultural (English and Chinese) competence, as well as the restrictive conditions of the coronavirus pandemic, are to be considered” in the context of the pandemic (p. 260). The authors found that learners were well aware of possible declines in establishing relationships with the culture of the foreign language they were studying. As such, Duolingo users may find online discussion boards to be a useful avenue to share cultural information and relative perceptions that may strengthen their ties with the foreign culture.

Foreign language exposure may provide benefits and possibly protective features among learners during the COVID-19 pandemic, which may improve their knowledge acquisition processes. Sheng et al. (2021) found that learners exposed to a more foreign-language-rich environment were more likely to perform better on comprehension and production tasks after the start of the COVID-19 pandemic compared to their pre-COVID-19 performance. In summary, traditional in-person language learning options were limited throughout the pandemic, potentially causing learners anxiety related to a lack of connections and relationships. A social connection is useful to language learners, offering motivation and support. As such, when examining learners’ foreign language proficiency through the lens of COVID-19,

it can be helpful to consider Duolingo as a supportive community that fosters a culture of foreign language understanding, which may be critical in improving knowledge acquisition and related skills needed to increase educational outcomes. Thus, the significance of this study is the addition of knowledge concerning online learning during the pandemic by considering language learning apps as a unique source of data for connecting learning and access to social support.

## **METHOD**

This study used netnography (Kendal et al., 2017) within a qualitative study design to examine how the COVID-19 pandemic might be associated with perceptions about foreign language learning on Duolingo. Topics examined included information exchanges and how students use discussion boards to look for and offer social support about how the pandemic has affected their progression.

Netnography was used as it helps the researcher engage in an in-depth, immersive description of online content within a particular cultural context. According to Kendal et al. (2017), a netnographer may analyze, observe, and document behavior in naturalistic environments. The use of netnography was appropriate, as access to the discussion boards may offer insight into learners' perceptions and expressions within the online foreign language learning community.

## **DATA COLLECTION**

The data gathered on the Duolingo discussion boards appeared on a public forum that does not include personal identifiers or sensitive information other than usernames and badges. Of the data collected, no learners used personally identifiable information, so no one learner needed to consent to have their data used for this study. To ensure privacy, no usernames were included in the reporting of findings.

Data filtering was used to locate relevant discussion posts. To be included in the study, discussion board postings needed to be relevant to COVID-19 and part of a discussion board that involved more than one user. Single comments on discussion boards that received no responses were excluded. The researcher selected the discussion boards to study by searching keywords such as "pandemic" and "COVID-19" within all available public discussion boards on the Duolingo website.

Out of a total 3,464 discussion boards from 38 language courses on Duolingo, 20 were included in the current study. Randomization methods were used to select the 20 boards referenced.

## **DATA ANALYSIS**

This study used inductive analysis as a form of logical reasoning wherein "individual observations are built up in order to make more general statements about a phenomenon" (Kozinets, 2010, p. 118). In examining the discussion boards, learners' posts were captured exactly as they appeared on the screen. The participants' grammar, spelling, or punctuation were not corrected. The discussion boards were examined, formatted into similar fonts, and saved as basic text to capture data accurately. Using Kozinets' (2010) data analysis methods, the researcher employed document analysis to examine the textual content on the sample of 20 discussion boards. The researcher used four steps during data analysis: coding, noting, abstracting and comparing, and theorizing to draw conclusions about the dataset. Data from the discussion boards were imported into NVivo to help with analysis.

First, relevant topics of interest were examined, highlighted as significant, and coded (Kozinets, 2010). Coding was used to identify categories through observed patterns in the data. Examples of codes used for this dataset included emotions (i.e., gratitude, anxiety, or feelings of isolation), actions (i.e., offering support and advice), and COVID-19. Next, noting was used to employ reflexivity about the data, including memos and annotations. Reflexivity is important for the researcher to maintain awareness of any biases they impose on their interpretation. An example of a data annotation that contributed to reflexivity is the statement, "What is the researcher's connection to the data being researched?" and "What is the object of analysis?" Abstracting and comparing were used to designate sequences, specific orders, processes, concepts, and patterns. In the case of this study, the main concepts and patterns used for data analysis were related to learners' social-emotional needs as expressed on the discussion boards. Finally, theorizing was used to draw conclusions about the categories and patterns. Rating codes and categories helped determine which themes were prevalent among the discussion posts concerning

the pandemic. Theorizing led directly to the three themes expressed below concerning COVID-19. Therefore, this research employed rigorous qualitative methods to ensure reliability and validity that aligned with the target population.

## RESULTS

The results of this study were based on a netnographic analysis of Duolingo discussion boards that included the COVID-19 pandemic as a mentioned topic. The two research questions were: What topics have learners perceived as important on Duolingo discussion boards during the COVID-19 pandemic, and how are these topics affected by the factors related to the COVID-19 pandemic? Out of a total of 3,464 discussion boards, 20 boards across a sample of 38 language courses were examined. For this research, boards ranged from 60 contributors to 508 contributors, with each contribution counting as one contributor. The average discussion board was comprised of approximately 198 contributions. Therefore, around 4,000 contributions were analyzed. By examining Duolingo's discussion boards, the researcher attempted to elucidate the topics learners expressed about the COVID-19 pandemic.

In Duolingo, discussion boards are available with each lesson for each language. For this study, conversations related to COVID-19 were not on discussion boards separate from the coursework. Instead, their discussions were included in discussion boards available throughout the 38 language courses. Data mining was used to find conversations that were relevant to COVID-19.

The following codes were identified and included the frequency of occurrence noted from the contributions of each discussion post analyzed. The code with the highest number of contributors was "social-emotional support" contributions (40 occurrences). This code includes the sub-codes of "personal sharing" and "encouragement." The code with the second-highest number of contributions was "gratitude" (30 occurrences), and sub-codes include "actions" and "gifting." The code with the third-highest number of contributions was "pandemic" (28 occurrences), and sub-codes included "impact," "sharing foreign medical language examples," and "connections during isolation." The data analysis concluded that each of the codes represented three themes.

## THEMES

Three themes emerged from the data analysis that helped the researcher understand how COVID-19 affected Duolingo users in the discussion board posts. The themes are community, generosity and gratitude, and COVID-19 language content.

### *Theme 1: Community*

In their posts, Duolingo users often talked about connecting to a higher power and spending time with family and loved ones, possibly building connections with like-minded foreign language learners. The users also sent supportive comments to each other. The Duolingo community engaged in speaking about how to support charities during COVID-19 by providing links to charitable organizations. Additionally, users provided advice to other users such as how to cope with self-isolation, managing inaccurate news about the extent of COVID-19 cases, communicating the seriousness of the situation in their own lives, and discussing information passed along by the media. The users also shared personal updates about how they managed their personal affairs during the pandemic and how it impacted them. The Duolingo discussion boards offered a space for users to vent about their frustrations, such as their irritation surrounding mass toilet paper and grocery hoarding in the early days of the pandemic. The comments below help to illustrate some of these elements.

**Comment:** I also wanted to add that for many people, this period of social distancing has meant more intimacy, more love, more care, more contact, less isolation than normal. There are many who have had more phone calls, conversations, and people asking if they are ok in the last few weeks than they have had for years. Some light can break out of this darkness. Remember each other.

**Reply 1:** Social distancing allows people to spend more time achieving personal goals and feeling better with their current situation. I myself have started learning Spanish and French much more intensely (on other sites as well) and have meditated more often. I would advise that everyone embraces their free time and reflects to help mental well-being. Follow advice, stay at home unless impossible, and thank the amazing NHS staff who try so hard to help as many people as possible. Oh, and keep learning!

**Reply 2:** One of my church leaders said that right now is the best time to get to know ourselves

spiritually, be closer to our families, and gain a deeper connection with God (Or for anyone else, whoever that God may be, if you have one). There is no doubt that the community has put aside all differences to combat this, whether it's global, national, or local. Shout out to medical staffs out there, politicians, church leaders, airline workers, and grocery store staff all on the front lines!

These postings are examples of how Duolingo users provided socio-emotional support to one another by displaying messages containing emotional intimacy, gratitude, advice, and language learning motivation. These exchanges are in contrast to reports from traditional university faculty, who stated that they found socio-emotional competencies difficult to sustain (Lloyd-Jones, 2021). Exchanges between users provide examples of how users tried to build a sense of community by sharing how they kept up productivity and learning on Duolingo, especially in relation to their foreign language studies.

**Comment:** I have tried learning Spanish in high school and college, but the traditional way was not working for me. During the start of COVID-19, I came up with a list of goals I wanted to accomplish while I am stuck at home.

1. Learn Spanish
2. Catch up on the latest movies and films from around the world
3. Learn how to cook amazing meals
4. Learn a new skill
5. Exercise each day for 1 hour
6. Walk the dog 2x a day

**Comment:** Since I started Duolingo, I noticed that I have been becoming more and more happy. Before, since my very close family member passed away from cancer, and I couldn't go say goodbye due to COVID-19, I was very sad. I felt so lost; I didn't know what to do with myself. I did Duolingo a long time ago, and then I started up again. It felt so good to have something to do with my time and occupied my mind. I started to feel like myself again. I stopped hating myself for not being able to say goodbye. That sounds stupid, but it was true. I feel like Duolingo has helped me a lot. And on top of that, it is teaching me something valuable. More than just a language. It sort of taught me that life is about experiencing as much as you can in your life.

That there is a point to live and learn.

This exchange presents an example of how the users communicated their daily tasks that could improve their emotional wellbeing during the COVID-19 pandemic to other users. Users such as these appeared to use the Duolingo app to form a sense of accomplishment within the confines of quarantine and social distancing. In addition, exchanges that showed a need for community were reflected in the discussion postings, as Duolingo users expressed their perspectives on learning a foreign language on the asynchronous discussion boards related to COVID-19.

### *Theme 2: Generosity and Gratitude*

Gamification contributes to the major popularity of Duolingo as an educational software (Neuschaefer, 2021). Lingots can be earned if users complete questions without errors or if users are active on the app daily. Lingots can also be gifted between users (Duolingo, 2021). For example, some healthcare workers on the discussion boards shared their experiences about serving in hospitals to care for sick patients during COVID-19. In response, users were grateful for their time and effort in combatting the disease. In addition, many users gifted health care workers lingots to use as Duolingo currency, as seen in the comment below.

**Comment:** I am learning French and Russian. I am in the healthcare (Netherlands, not in the front line, but it looks like soon I am going there. Too tired after work), and it looks like I am not going to be able to continue my streak as I was doing before. Is there a way to buy something like a weekend pass but longer? Lost my streak at 24 April. Thank you all for giving me lingots. I bought some days from those. Stopped learning Russian, it just not felt good after seeing their low numbers. When I had some free hours, I watched "La casa de papel" and tried to learn Spanish. I now understand the song "Vamos a la playa" from 2000 better than I did before.

**Reply 1:** Thank you, and everyone who is in health care, making masks at home, working to keep our grocery stores stocked, creating home school packets to send home with students, driving buses to deliver "school lunches" to children who rely on these meals to survive, and everyone else who is helping our lives continue as normally as possible in these trying times. Folks, if you want to give away lingots, that's great -- but please DON'T



CREATE A COMMENT about it. Let's keep this discussion focused and not fill it up with comments that just make it load slowly.

**Reply 2:** Well said P\*\*\*\*\*r! I give you 4 Lingots for your comment because it is friendly and serious, what makes you a sympathetic person. Kind regards.

These exchanges are examples of how Duolingo users communicated compassion for those who experienced hardship during the pandemic, prompting some users to attempt to boost essential worker morale by gifting those users the Duolingo currency. As such, the discussion boards were filled with users who displayed generosity as a means to build connection and community.

The discussion boards also provide a venue to vent their frustrations, which may be illustrated in the comments, such as "don't create a comment" about gifting lingots, as shown above. However, other users may ignore these frustrations, perhaps to sustain a sense of entertainment on the forum for themselves and other users. The users also expressed gratitude towards the moderators, discussion contributors, and people in the greater community, including hosts and educators (see the following example from one Duolingo user).

**Comment:** Next, a thank you to the **Mods**. Without you, our forum would be overrun with spam, posts that put people down, and questions going unanswered. Thank you for all that you do to keep our forum clean and safe for all people. Thank you to the course **Contributors**: Going to be completely honest: Ya'll are my favorite. Thank you for giving your time to make Duolingo what it is: language learning. Thank you to our **Hosts**... because of your work, we can still practice our languages outside with other people. Thank you for dealing with bad connections, late people, lots of distractions, and people bailing last minute. Thank you to our **Educators**, teachers who go above and beyond every day for students. Thank you for helping our community.

Examining this discussion post example among other postings, the users appeared to use the platform to connect with individuals who were going through hardship during the COVID-19 pandemic and were able to connect with these people who they may not have had access to in their immediate lives. Users reached out to healthcare workers and educators. However, users also expressed gratitude

to the other discussion board contributors as a whole and the forum moderators. The theme of generosity and gratitude helps address the research question, as Duolingo users expressed their perspectives. User exchanges demonstrated users' gratitude and generous nature among their discussion postings.

### *Theme 3: Discussion about COVID-19 Language Content*

Supporting the theme of COVID-19 language content, many posts expressed a user's desire to learn how to communicate about COVID-19 in a foreign language. Seventeen users wanted Duolingo to add a learning section about COVID-19 to the lessons, as illustrated in the comment below. Since Duolingo does not offer such content, users provided links for others to learn about the vocabulary and phrasing related to COVID-19. For example, one user offered a link to the World Health Organization language offerings on COVID-19, available for official United Nations languages, including vocabulary, familiarity, and concepts in Arabic, Chinese, English, French, Russian, and Spanish. These links included <https://openwho.org/channels/COVID-19> and <https://openwho.org/channels/COVID-19-national-languages>. The users mentioned that understanding vocabulary and phrasing about the pandemic in more languages might improve users' safety.

**Comment:** I was thinking about something the other day... Since the COVID-19 pandemic is far from being over, it might be interesting for Duolingo to add an extra 'lesson bubble' about this topic to their courses. Most of the lessons on Duolingo cover aspects of our daily lives. Since the Coronavirus, unfortunately, has become part of our lives, it only seems logical for me to add a lesson about it in the course pack. Moreover, many people use Duolingo because they are planning to travel abroad... being familiar with the right COVID-19 vocabulary/phrases of the language you're learning can be very helpful... It might even slightly improve everyone's safety :-)

The learners also shared sentences about COVID-19 in English and their respective translations in languages such as Spanish and French, which speaks to their desire to connect to a larger community outside geographic confines. The comments below show a desire to communicate about the pandemic using a foreign language, perhaps

to show themselves that they are achieving something they are proud of in the midst of hardship. As such, this juxtaposition points to users finding “the good” in something that has been primarily a negative experience.

**Comment:** “This virus is a problem all over the world.” (“Ce virus est un problème dans le monde entire.”)

**Comment:** “There’s demand, but there isn’t enough production.” (“Hay demanda, pero no hay suficiente producción.”)

**Comment:** “When we have the vaccine, there won’t be any more problems.” (“Cuando tengamos la vacuna, no habrá más problemas.”)

The COVID-19 pandemic has brought learners new opportunities to engage with the Duolingo community through discussion boards on topics such as social connection, news, and updates about the virus as circulated by the media, personal updates, advice, gratitude, giving, and venting about their struggles. Duolingo may provide a good avenue for online learners to form connections and community with like-minded individuals seeking personal growth and engage in more intimate foreign language learning exchanges on the platform.

## DISCUSSION

This study examined discussion board posts related to COVID-19 on the Duolingo platform to better understand how the pandemic has affected learners’ exchanges during their foreign language learning studies. Specifically, this research asked: How have Duolingo users expressed their perspectives on learning a foreign language on the asynchronous discussion boards during COVID-19? By examining Duolingo’s asynchronous discussion boards, findings present how users adjust their foreign language learning on Duolingo and how the pandemic impacts their learning.

The analysis employed netnography to study data on the discussion boards and led the researcher to identify three themes, including community, generosity and gratitude, and information-seeking about COVID-19-related vocabulary and phrases. The pandemic has affected language learners’ emotional conditions, which motivates further research to examine ways in which learners can share their experiences, vent about their difficulties, and build community connections in a safe, virtual setting. Specifically, Mohammed

and Mudhsh (2021) found that language learners experienced increased negative anxieties related to internal and external factors, such as quarantine and isolation. The findings from this netnographic study reflect the ideas of Mohammed and Mudhsh (2021) as Duolingo users posted discussions that demonstrated offering socio-emotional support to one another. Similar to Aqeel et al. (2020), the current study found evidence that Duolingo users experienced hardships associated with COVID-19, which may have negatively impacted their emotional wellbeing. However, Duolingo has provided a virtual avenue for growing their foreign language learning community while connecting users with greater intimacy.

Lloyd-Jones (2021) found that collaboration and emotional support in a learning community may allow learners to pivot for greater success in the midst of the pandemic. By sharing hardships and newly relevant learning materials related to COVID-19, the Duolingo forums may play a role in collaborative functions, thereby increasing a sense of community in an effort to reach common goals (Lloyd-Jones, 2021). One shared goal that this research uncovered was the desire to communicate effectively about COVID-19 in foreign languages. Users shared relevant vocabulary terms and common phrases, which could improve learners’ familiarity with COVID-19-related topics in foreign language communications.

The analysis showed that Duolingo discussion boards might help provide three features to improve motivation to reach educational goals: instrumental, informational, and emotional support (Lloyd-Jones, 2021). When learners experience negative emotions or are overcome with peripheral anxieties, it is difficult for them to absorb new material without acknowledging their fears, anxieties, and sadness associated with extraordinary situations (Albrecht & Goldsmith, 2003). The analysis of the Duolingo discussion boards sheds light on how facilitated supports may assist learners in reaching their foreign language learning goals more easily than without this sense of community.

Previous research has shown that Duolingo discussion boards are effective in providing instrumental support in topics such as technical tools, procedures, and processes related to the platform (Neuschafer, 2021). Additionally, Neuschafer (2021) found that the discussion boards may also

provide informational support, such as peer-to-peer knowledge that is a benefit of instant communication on an asynchronous discussion. However, the current study has shown that Duolingo discussion boards can also provide emotional support, wherein learners obtain social encouragement and a sense of community that may give them a new perspective on learning foreign languages during the COVID-19 pandemic.

Chen and Yang (2006) showed that collaborative learning platforms could provide an optimal learning environment for many users. For example, traditional classrooms often use virtual learning that works within confining schedules, which may decrease inclusivity among those with competing agendas and timelines (Withers et al., 2021). Many foreign language learners may have had to spend more time in settings that do not provide optimal learning environments. Furthermore, if these learners were affected by school shutdowns and quarantines, they may not have been able to transition to virtual courses easily. As such, Duolingo may be a more inclusive and equitable alternative for foreign language learning during the pandemic due to its flexibility in participation while providing a learning environment that encourages emotional and social supports.

#### **PEDAGOGICAL IMPLICATIONS AND LIMITATIONS OF THE STUDY**

Many second language educators use language learning programs to support language acquisition skills. The findings from this study may help language educators understand the perceptions of learners and their anxieties and concerns throughout the pandemic. With an understanding of learners' experiences, educators can create support systems scaffolded for potential student support. Scaffolding supports learning level by level until users demonstrate competence or mastery of a topic of subject (Wood et al., 2007). Scaffolding in a second language classroom supports the needs of language learners through visual aids, presenting common words and phrases, and reinforcement activities (Yakaeva et al., 2017). Duolingo presents scaffolding through the use of common phrasing, repetition, and visual aids, helping second language learners build complex skills. Findings may support school systems providing more funding to language programs as educators need access to more

technology to support language learning needs.

The participant base of the study was structured so that no background information was gathered from the learners. With no background on the learners, it is difficult to understand how perceived experiences with Duolingo, language learning, and the effects of COVID-19 have evolved or changed through various stages of the pandemic. Therefore, there are limitations on how to transfer these findings across different learning groups.

#### **RECOMMENDATIONS**

This study used a netnographic approach to data collection and analysis. To understand the dynamics of the users, future researchers may consider conducting a qualitative narrative study to gather demographic information on the users in addition to detailed perspectives on experiences. This study had limitations, mainly due to the small sample size of 20 discussion boards. In addition, this dataset does not trace the experiences of particular learners, so it is not possible to observe changes in learners' perceptions. In future research, it could be useful to trace multiple posts by the same users in order to see if any trends develop over time in learners' responses to the COVID-19 pandemic. In addition, the role of informal learning resources in students' social-emotional resilience deserves further exploration. It is an underexplored area of research on learning during the pandemic, which tends to focus on the online resources of formal learning environments, such as K-12 schools. The findings of this study pertain to a sample of 38 language courses available on the Duolingo platform. The findings could be generalized to Duolingo users that have contributed to the discussion boards. As the findings cannot be generalized to other language learning platform users, future researchers may consider a conducting a similar study examining discussion boards on other learning platforms. Educators and researchers could benefit from understanding how language learners benefit from using the discussion boards.

#### **CONCLUSION**

This study was the first to examine how Duolingo users interacted with one another on asynchronous discussion boards in the context of COVID-19. The researcher analyzed 20 discussion boards that contained exchanges related to the pandemic. Netnography was used to analyze the discussion board data and identify three themes,

including community, generosity and gratitude, and information-seeking about COVID-19-related vocabulary and phrases. The results showed that users were thankful that Duolingo was able to offer them a respite from the day-to-day difficulties of isolation, quarantine, and anxieties related to the pandemic. As such, Duolingo may be an effective way for online learners to develop a sense of community while increasing their foreign language learning during COVID-19.

Since this study offers insights into the social-emotional state of learners, it has implications for the use of Duolingo as a pedagogical tool for teachers. The findings highlight the anxiety learners are experiencing during the pandemic, many of which might not be addressed in other online platforms. Educators can use Duolingo and other online platforms to better understand the predicaments their students face during the pandemic.

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