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EMPOWERING LANGUAGE LEARNING: THE CRITICAL ROLE OF MODERATORS IN DUOLINGO'S GERMAN DISCUSSION BOARDS

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Abstract

Asynchronous discussion boards provide learners with an online platform to collaborate and communicate. This study aims to investigate the pivotal role of moderators in managing and enhancing the dynamics of asynchronous discussion boards in Duolingo's German language learning environment. There are nearly nine million individuals who use Duolingo to learn German. This study implemented netnography to examine six moderators on Duolingo German language discussion boards. From an initial potential pool of 12 participants, two participants were chosen at random from three levels of engagement: high, moderate, and lower, for a total of six moderators. Moderators who commented at least 150 times were considered highly engaged; those with at least 25 comments were moderately engaged, and those with fewer than 25 comments were lower engaged. Data collection involved analyzing comments posted between 2013 and 2022. The study examined the frequency of comments, number of language badges, German course level, total posts, and years using Duolingo. However, activities occurring 'behind the scenes,' such as deleting inappropriate comments and providing feedback to developers, were not analyzed. The analysis covered 26 discussion boards, with five boards per participant, except for one user. Thematic analysis was used to identify patterns in moderator behavior and its impact on learner engagement. This methodology supported the investigation of how Duolingo German moderators oversee asynchronous discussion boards, allowing us to analyze and understand the evolving needs and engagement levels of learners within this online community. The results of the netnography showed that there were three themes. The findings support past research, which suggests the moderator role extends beyond mere oversight, providing management of online discussion boards, contributing significantly to the success of language learning programs, and enhancing the overall learning experience.

Keywords: asynchronous learning, discussion board, language learning, online moderator, usage over time

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Introduction

Asynchronous discussion boards have become essential tools in online education, providing learners with platforms to collaborate and communicate beyond the constraints of time and space. While their use surged during the COVID-19 pandemic (Fernández Gutiérrez et al., 2022; Neuschafer, 2021), the effectiveness of these boards is not solely dependent on their existence but on the quality of their moderation. Delahunty (2018) argued that discussion boards foster flexible and reflective thinking, yet this potential is often unrealized without effective moderation.

The role of moderators in online learning environments is pivotal (Asterhan & Schwarz, 2010), ensuring that discussions are conducted professionally and are relevant to the course material. Moderators play a pivotal role in the dynamics of asynchronous discussion boards in an online learning environment (Müller & Mildenberger, 2021) like Duolingo. Despite their importance, there is a gap in understanding how different levels of moderator engagement impact the dynamics of asynchronous discussion boards. Prior studies have acknowledged the need for active participation by moderators but have not delved into the variations in engagement levels among them (Müller & Mildenberger, 2021; Seering et al., 2022). This oversight leaves a gap in the literature, as the nuances of moderator involvement can significantly influence learner outcomes.

The current research largely describes the functions of moderators without critically examining the challenges they face or the strategies they employ (Müller & Mildenberger, 2021; Seering et al., 2022). This lack of critical analysis influences the development of frameworks for effective moderation in online learning environments like Duolingo. By examining how moderators with varying levels of engagement manage asynchronous discussion boards, this study aimed to address this gap, offering insights into optimizing these platforms for empowering learner engagement and self-efficacy. The need for this research lies in the increasing reliance on online learning environments and the need to ensure effectiveness through improved moderation strategies.

Duolingo's asynchronous discussion boards, also known as *dynamic discussion boards*, are integrated with language learning courses, allowing learners to post comments, questions, and suggestions related to their lessons (Duolingo Forums, 2013). While these boards are accessible to users via desktop computers or mobile browsing apps such as Safari or Google Chrome (Neuschafer, 2022b), their potential for enhancing language learning is influenced by the effectiveness of their moderation. Despite widespread availability, the quality of interaction on these boards varies, raising questions about the factors that contribute to their success or failure.

The user base on the discussion boards is diverse, comprising average users, Duolingo Plus members, Global Ambassadors, and moderators (Neuschafer, 2021). With approximately 500 million users across 194 countries (Curry, 2021), the discussion boards serve a global community, each segment experiencing different levels of access and engagement. Average users, constrained by Duolingo's gamification structure, must navigate limitations such as the 'hearts' system, which can impede continuous learning and interaction (Shortt et al., 2023). In contrast, Duolingo Plus members enjoy uninterrupted access due to automatic heart replenishment, potentially fostering greater engagement on the discussion boards.

Global Ambassadors, selected for their language mastery and leadership qualities, can apply to become moderators. In their role, moderators are tasked with maintaining the quality of interactions by answering questions and removing inappropriate content (Neuschafer, 2021). However, this hierarchical structure and the varying levels of user engagement it entails are not without challenges. The differential access and roles of users and moderators highlight the need for a deeper understanding of how these dynamics affect the learning environment. This study addressed this gap by examining moderators' roles and engagement levels, providing insights into optimizing the functionality and effectiveness of Duolingo's discussion boards for all users. The need for this research was based on the necessity to create equitable and productive online learning spaces in an increasingly digital educational environment.

While Cornell University's Center for Teaching Innovation (2021) provides a guide for discussion moderators that emphasizes neutrality and supervision, there are underlying challenges that this role presents in online learning environments. Moderators are expected to engage in polite, professional discussions, sharing relevant experiences and ensuring that user-generated content is pertinent to the course material (Cornell University, 2021). However, this idealized role often overlooks the complexities and conflicts that arise in real-world applications. For instance, moderators must balance their knowledge and experience with the need to maintain an inclusive and respectful environment, which is far from straightforward (Li et al., 2023). They are also responsible for identifying and addressing inappropriate content, abusive language, personal attacks, and spam, which adds a layer of complexity to their role (Cornell University, 2021). Moreover, Duolingo moderators face the additional challenge of protecting minors by ensuring they do not disclose their age to other users. These multifaceted responsibilities highlight the critical need for more nuanced research into the effectiveness and challenges of moderation in online educational communities.

With nearly nine million users learning German on Duolingo (Neuschafer, 2022a), the platform's extensive range of courses, spanning levels 1 to 25 and including 144 units or 'skills,' presents a rich landscape for understanding learner engagement. Previous research by Neuschafer (2021) utilized netnography to assess the evolving needs of learners across different units of the German language course, shedding light on the dynamic nature of online language learning communities. However, the specific role and impact of discussion board moderators remain underexplored in academic literature. This study aimed to address this gap by examining how Duolingo German moderators manage asynchronous discussion boards at varying levels of engagement: high, moderate, and lower. The researcher sought to provide valuable insights for educators, software developers, and researchers by investigating this gap. Understanding the nuances of moderator roles can inform the management and design of online discussion environments, ultimately enhancing the instructional design of language learning programs (Brace-Govan, 2003) and empowering language learners.

Method

This study implemented netnography to examine Duolingo German discussion board moderators with high, moderate, and lower levels of engagement in discussion boards. Netnography is used to analyze publicly available online data

on discussion boards in a naturalistic setting (Heinonen & Medberg, 2018). Netnography is a research methodology involving the ethnographic study of online communities and social interactions to gain insights into participants' behaviors, beliefs, and culture within these virtual spaces (Addeo et al., 2019).

Delaney et al. (2018) noted that netnography is appropriate for contextualizing and identifying ideas, questions, concerns, and thoughts of users on asynchronous discussion board forums. This methodology supported the current investigation of how Duolingo German moderators oversee asynchronous discussion boards by allowing the analysis and understanding of the evolving needs and engagement levels of learners within this online community. Through a netnographic design, researchers and educators can gain valuable insights into students' online behavior, learning preferences, and needs within virtual communities, helping to adapt and enhance educational approaches (Uştuk, 2022). In the context of online learning, learning engagement is a crucial factor, encompassing behavioral (being on task), cognitive (exerting effort), and affective (being interested in the task) dimensions (Christenson et al., 2012; Reeve & Tseng, 2011). Interactive discussion, as described by Sulistyo et al. (2023), fosters a learner-centered environment that encourages active participation, peer interaction, and critical thinking, all of which contribute to higher engagement levels.

The benefits of online learning platform discussions have been well-documented. Sulistyo et al. (2023) found that online feedback and interactive discussions create an interactive atmosphere where students engage more deeply with the content and their peers. By employing netnography, this study aimed to understand how the interactive nature of online discussion boards, similar to online discussions described by Sulistyo et al. (2023), impacts the engagement and learning outcomes of Duolingo German learners. This approach allowed for a comprehensive analysis of the moderators' roles and the dynamics of learner engagement, providing valuable insights for enhancing online educational practices (Uştuk, 2022).

Participants and data collection

This study examined six moderators on German language discussion boards out of a pool of 12. From the potential 12 participants, two moderators were selected at random at three levels of engagement (high, moderate, and lower). Moderators who commented at least 150 times were considered highly engaged moderators. Highly engaged moderators are typically very active in discussions, providing frequent assistance and detailed explanations to learners, often recognizable by their extensive interaction history and high level of expertise badges. Next, those moderators who commented at least 25 times were considered moderately engaged. Moderately engaged moderators participate regularly, offering support and answering questions, but with less frequency than highly engaged moderators, and they often have a noticeable but less extensive badge collection. Moderators with fewer than 25 comments were lower-engaged. Lower-engaged moderators contribute occasionally, usually focusing on specific topics or questions, and they may have a limited number of interaction badges and a less visible presence in the community.

Moderators, who are volunteers selected through an application process, assist users in navigating discussion forums, answering questions, and ensuring

compliance with Duolingo's terms and guidelines. Although the researcher was able to examine the frequency of comments, the number of language badges, German course level, total posts, and years using Duolingo, moderator activities that have taken place "behind the scenes" cannot be analyzed using netnography. These activities may include deleting comments that are not used within the guidelines of the discussion board rules and providing feedback to software developers. The analyzed comments were posted between the years 2013 and 2022. Apart from one user, five discussion boards were analyzed per participant, totaling 26 boards. A common number of five discussion boards was necessary to determine consistency across engagement levels, and this number was attainable even for lower-engaged moderators. The public discussions on these boards provided the data for analysis in this study.

Data analysis

The current study used netnography as the method for analyzing comments made by moderators on Duolingo German courses. Kozinets (2010) outlines netnography in six steps: (1) coding, (2) noting, (3) abstracting and comparing, (4) checking information and refining, (5) generalizing, and (6) theorizing (see Figure 1).

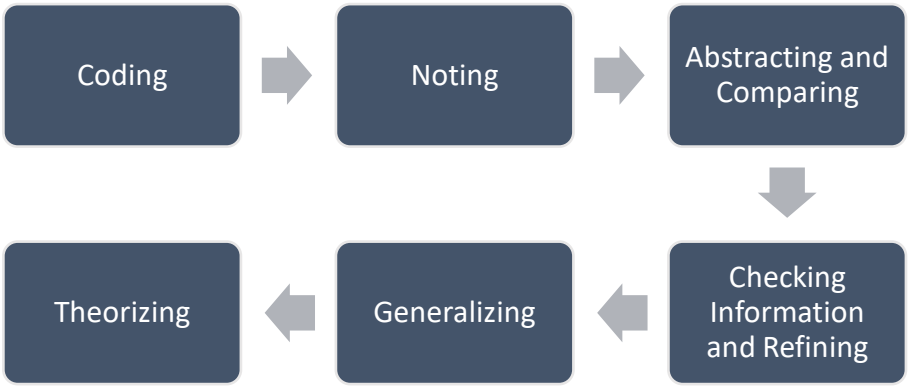


Figure 1. Steps to netnography analysis

Using *coding*, the researcher drew codes and categories from the discussion board comments on 26 boards. Initially, all comments from the 26 discussion boards were systematically coded to identify recurring themes, issues, and patterns in moderators' interactions with learners. This process involved creating initial codes based on the content of the comments. *Noting* was used by the researcher to log reflective memos on the margins of the note-taking medium. Reflective memos were used throughout the coding process to capture the researcher's observations, interpretations, and questions. These memos provided insights into the context and nuances of each moderator's contributions. *Abstracting and comparing* were used to identify similar phrases, patterns, relationships, shared sequences, and differences throughout the moderator's comments. *Abstracting* was used to identify distinctions or discrepancies within categories (Kozinets, 2010). Abstracting and comparing were employed to identify similarities, differences, and relationships

across the coded data. This step focused on grouping similar codes into broader categories and examining variations within these categories. The researcher used *checking and refining* to filter and separate information to examine patterns, differences, similarities, and processes. To ensure accuracy and reliability, the researcher systematically checked and refined the coded data. This involved revisiting the original comments to verify interpretations, resolve discrepancies, and clarify ambiguities that emerged during coding and abstraction. *Generalizing* was used to expound upon how the findings may explain tendencies of a greater population of Duolingo moderators. Findings were generalized to interpret how the identified themes and patterns might reflect broader tendencies among Duolingo moderators. Finally, *theorizing* was used to draw conclusions about the findings of the analysis. The study used theoretical frameworks to interpret the findings in relation to existing literature and theoretical concepts. Theorizing allowed for the formulation of conclusions about the roles, behaviors, and impacts of moderators in online language learning communities.

Trustworthiness in this study was upheld through rigorous methodological practices. For example, credibility was ensured by reviewing and cross-checking the codes during the initial coding phase to enhance the reliability of interpretations and maintain consistency in identifying themes and patterns from the moderators' comments on Duolingo German courses. Transferability was facilitated by providing detailed descriptions of the coding process, enabling readers to assess the applicability of findings to similar educational contexts. Methodological strategies collectively ensured that the study's findings were trustworthy.

Findings and Discussion

Findings

The purpose of this study was to examine how Duolingo German moderators oversee asynchronous discussion boards across levels of high, moderate, and lower engagement. Highly engaged moderators, defined as those who commented 150 times or more, demonstrated extensive involvement and expertise within the Duolingo community. They exhibited a consistent presence over an extended period spanning multiple years and significantly contributed to discussions by offering detailed explanations and demonstrating mastery of German language concepts. Moderately engaged moderators, who commented at least 25 times, engaged intermittently and often found themselves overshadowed by highly engaged counterparts in responding to user queries. Their contributions, although valuable, were limited in frequency compared to highly engaged moderators. Lower engaged moderators, posting fewer than 25 times, initially demonstrated potential but were less active overall, potentially due to the dominance of highly engaged moderators in addressing user questions.

Highly engaged moderators

Highly engaged moderators commented 150 times or more and had an average of 1315 posted comments. Five discussion boards were analyzed for Users 1 and 2, with ten discussion boards overall. Highly engaged moderators made comments over a longer period of time over a span of many years, "dominated" the discussion boards, and had the highest proficiency in demonstrating German mastery and explaining course concepts.

Moderator 1 was a prolific Duolingo learner, having participated in 24 different language courses, with a level 20 in German. Moderator 1 made a total of 2267 comments and was also a Plus member. They made the greatest number of comments of any moderator on Duolingo German. Their post-engagement showed that they had 89 total months and 25.47 average months. Moderator 1 appeared to dominate most of the Duolingo discussion boards, which left little space for other moderators to offer assistance. The analysis showed that once a moderator responded to a user's question, other moderators would not offer additional assistance or perspective for that question. Moderator 1 encouraged users to use critical thinking, which also encouraged them to post more frequently on the discussion boards in reply. They answered questions in a way that inspired additional questions from users and motivated confidence in the discussion boards; users likely felt that someone would be aptly able to respond to their questions with thorough explanations. Moderator 1 made sure to highlight the parts of the users' questions that they addressed when responding to their comments, which made the structure of their responses uniform and clear.

In a discussion board titled "Wir kommen aus Großbritannien" (We come from Great Britain), a user stated, "I put we come from the United Kingdom, and duo told me that I was wrong." Moderator 1 responded, "Of course. It's not correct English; the country is "the United Kingdom. *Großbritannien* means "Great Britain," not "the United Kingdom." This answer encouraged the user to ask an additional question, contributing to more depth of the topic on the discussion board: "We are coming from Great Britain.' Is that really wrong? If yes, please explain why :)" Moderator 1 was an invaluable resource to the German discussion boards and appears on nearly every board, encouraging critical thinking and continued discussion of the study topics.

Moderator 2 participated in five different language courses and completed level 25 of the German course. This moderator was not a Plus member but posted a total of 363 times in 2015. Their post-engagement was 39 total months and 9.31 months on average. Moderator 2 did not respond to questions that Moderator 1 had already addressed, giving this user fewer opportunities to interact with the learners. However, they were able to offer comprehensive grammar explanations, naming the parts of speech and providing examples. They also offered information about navigating Duolingo and how to access its "Tips and Notes" pages. This user appeared more frequently on boards that Moderator 1 had missed or chose not to respond to, particularly on older forums.

Among the highly engaged moderators analyzed, Moderator 1 exemplified productive engagement, participating actively across various Duolingo German discussion boards. They consistently provided detailed responses that encouraged critical thinking and further discussion among users. Moderator 2, although less productive than Moderator 1, also demonstrated a comprehensive understanding of grammar and Duolingo navigation, complementing the contributions of Moderator 1 on less frequented discussion boards.

Moderately engaged moderators

Moderately engaged moderators commented at least 25 times and had an average of 1315 posted comments. Five discussion boards were analyzed for Users 1 and 2, with ten discussion boards overall. Moderately engaged moderators made

comments over a relatively shorter duration of time and were often "boxed out" of answering questions by highly engaged moderators. Moderator 3 was a Plus member who made 30 comments in total in 2013. They had a post-engagement of 8 total months and 3.75 average months. This moderator had participated in 10 Duolingo language courses and was a Plus member. It appears that Moderator 3 was not a native German speaker but had completed level 25 with a mastery of Portuguese. Moderator 3 provided some insight into their role as a moderator on the Duolingo boards.

In a post named "Die Erde" (The soil), a user asked, "u help make Duolingo?" after Moderator 3 addressed another user's question. Moderator 3 replied, "I'm a forum moderator and a course contributor for English-Portuguese and German-Portuguese. I help organize and fixing the course content, but I haven't created any of the courses". The other user replied, "Well, still, you do a part in FIXING Duolingo, and that's almost as important as making the real thing." It appears that users were not always clear about the functions of the moderators on the discussion boards. In a prior study, Neuschafer (2022b) noted that Duolingo employees who manage or create course materials or designs do sometimes comment on discussion boards, so it may be confusing for users to understand the roles and authority of a moderator or an employee. However, it appears that moderators typically answer content-related questions while employees address questions related to the website, discussion board rules, and learning resources (Neuschafer, 2022b).

Moderator 4 was a Plus member who made 25 total comments between 2017 and 2019. They had a post-engagement of 8 total months and 3.12 average months. They participated in 39 different language courses on Duolingo and had completed level 25 of German. This moderator was particularly adept in finding answers that Duolingo marked as incorrect that were, in fact, correct. They would often encourage users to report incorrectly designed answer choices. In a post titled, "Die Äpfel der Mädchen sind rot" (The girl's apples are red), Moderator 3 noted, "About the apostrophe being marked as a typo: This is a bug in the software, nothing the course contributors can do about it. Please report a bug (Moderator 3 includes link) to Duolingo staff". However, since Moderator 1 answered the majority of the users' questions on this board, they were likely boxed out of participating in the discussion questions. Overall, moderately engaged moderators provided helpful answers about the Duolingo courses, often offering perspectives about the website and reporting bugs. However, they may have experienced highly engaged moderators helping most of the learners who needed assistance.

Moderately engaged moderators, such as Moderator 3, engaged less frequently but provided valuable insights into course organization and content clarification. Their role was essential in addressing specific user questions that were not covered by highly engaged moderators. Moderator 4 contributed by identifying and reporting software bugs, highlighting their role in maintaining the functionality of Duolingo's language courses despite less frequent engagement.

Lower-engaged moderators

Lower-engaged moderators began to make detailed posts at the earlier stages of their appointment but may have stopped because highly engaged moderators were thoroughly answering the users' questions. Lower-engaged moderators posted fewer than 25 times. The two lower-engaged moderators who were analyzed had

an average post engagement of 4 across a total of six discussion boards. These moderators were largely inactive.

Moderator 5 had a total of seven posts between the years 2013 and 2016. Their post-engagement was five total months and 1.4 months on average. They were not a Plus member but had six different language badges and had completed level 25 in German. In this user's early posts, they provided detailed grammar information. However, Moderator 1 also replied to other questions on this discussion board, so perhaps their responses felt unnecessary. Moderator 5 only answered one question extremely thoroughly. In a post titled, "Beide mögen Kaffee" (Both of them like coffee). Moderator 5 stated:

It's "beide" when it's "both" in the nominative and accusative *without* an article like the sentence above, "Beide mögen Kaffee" or "Ich mag beide." It's "beiden" in the dative case when there's no article, as in "Mit beiden Händen" or "Gib beiden Menschen Kaffee.", etc.

> *It's also "beiden" when it follow the plural definite article as in "Die beiden sind groß." It's like that in all cases: Nominative: die beiden Accusative: die beiden Dative: den beiden Genitive: der beiden*
> *And then there's "beides" "beide" is used in the plural, for **countable** objects: "Soll ich Mama oder Papa holen?" - "Beide **sollen** kommen!" "Das Radio und das Grammophon standen im Freien, beide **wurden** nass vom Regen."*
> *"beides" is used in the singular, for uncountable objects or abstract objects: "Magst du Ketchup oder Mayo auf die Pommes?" - "Beides **muss** drauf!" "Was machst du lieber: Geschirr spülen oder Wäsche bügeln?" - "Das **ist** beides ätzend!"*
> **Average User:** *Wow! Thanks for the really detailed answer, kaiengle. It really helped.:)*
>
> **Average User:** *Thank you! Can't we just put this in the Tips and Notes section? Not that the dative case is explained up to this point.*
>
> **Average User:** *Seriously. How are we supposed to know this???*

Lower-engaged moderators appeared to have a mastery of German, but it appears that they did not always find opportunities to demonstrate their skills in moderating. As such, it may be important for Duolingo to be aware of how the current perspectives on subjects are now condensed to one moderator on Duolingo German discussion boards and perhaps actively seek to increase them.

Moderator 6 had 36 "badges," which meant that they had participated in 36 different language courses. This user had completed level 25 of German and was active in 2015. This Plus member had a post engagement of 1 total month and one month on average. They appeared to be a native German speaker and only commented that they had agreed with another user in their explanation of course content. Therefore, there was not enough data to form conclusions about their moderating activities.

Lower-engaged moderators, like Moderator 5, displayed proficiency in German grammar and language nuances but were limited in their overall impact due to infrequent participation. Their contributions, while informative, were overshadowed by the more active engagement of highly and moderately engaged

moderators. Despite having extensive experience in multiple language courses, Moderator 6 participated minimally in discussions, limiting the insight into their moderating activities. Overall, these findings highlight distinct patterns of engagement and contribution among Duolingo German moderators, influencing the dynamics of user interaction and support within the community.

Discussion

This study investigated the roles and engagement levels of moderators on Duolingo's German language discussion boards, categorizing them into highly engaged, moderately engaged, and lower engaged based on their interaction frequency. Highly engaged moderators, characterized by extensive participation and expertise, dominated discussions and significantly contributed to user interactions. Moderately engaged moderators provided valuable support but were overshadowed by their highly engaged counterparts, while lower engaged moderators, despite their proficiency, had minimal impact due to infrequent participation. The findings underscore the essential role of moderator engagement in fostering productive interactions on asynchronous discussion boards. Highly engaged moderators not only facilitated learning by providing detailed explanations and encouraging critical thinking but also maintained consistency and depth in user interactions. Moderately engaged moderators offered supplementary support but faced challenges in competing for user engagement. Lower engaged moderators demonstrated proficiency in language nuances but struggled to establish a significant presence, limiting their influence on user interactions.

These findings validate existing literature highlighting the pivotal role of moderators in online learning environments (Asterhan & Schwarz, 2010; Müller & Mildenberger, 2021). Similar studies have emphasized the importance of active moderation in enhancing learner engagement and satisfaction (Delahunty, 2018; Neuschafer, 2021), aligning with our observations of moderator behaviors across engagement levels. The study extends prior research by exploring variations in moderator engagement and their implications for online language learning communities. Compared to previous research focusing on general moderator functions, this study examined the impact of varying engagement levels on moderator effectiveness within Duolingo's specific context. While some studies have discussed the benefits of active moderation (Christenson et al., 2012; Reeve & Tseng, 2011), the current findings provide new insights into how differing levels of moderator engagement influence learner interactions and support learning dynamics.

The findings from the current netnographic study address gaps in the existing literature concerning moderator engagement levels and their specific impacts on online educational platforms. By categorizing moderators based on their engagement, this study emphasizes the varying contributions and challenges faced by moderators in maintaining interactive and supportive learning environments. These insights are crucial for designing effective moderation strategies that optimize user engagement and learning outcomes in online language learning contexts. The findings demonstrate that highly engaged moderators play a central role in shaping the dynamics of asynchronous discussion boards on Duolingo's German language platform. Their active involvement enhances user interaction and supports deeper learning experiences. Moderately engaged moderators contribute

supplementary support, while lower engaged moderators, despite their proficiency, face challenges in establishing significant impact due to limited participation. Future research could explore strategies to enhance moderator engagement and effectiveness further, thereby optimizing the educational benefits of online discussion boards.

Conclusion

The purpose of this study was to examine the question, "How do Duolingo German moderators oversee asynchronous discussion boards per levels of high, moderate, and lower engagement?" Moderators uphold the principles of neutrality and fairness, supervising comments on various topics posted by users (Chen et al., 2020). Moderators not only facilitate discussions but also provide valuable insights, sharing their expertise and experiences related to the language course (Gray, 2004). Importantly, moderators act as vigilant gatekeepers (Bruckman, 2006), promptly identifying and addressing any inappropriate content, abusive language, personal attacks, spam, or disrespectful conduct. Furthermore, they have a responsibility to protect the safety and privacy of all users.

The analysis used netnography to examine moderators' comments across 26 German language discussion boards. The results of the netnography showed that there were three themes: (1) highly engaged moderators made comments over a longer period of time over a span of many years, "dominated" the discussion boards, and had the highest proficiency in demonstrating German mastery and explaining course concepts; (2) moderately engaged moderators made comments over a relatively shorter duration of time and were often "boxed out" of answering questions by highly engaged moderators; (3) lower engaged moderators began to make detailed posts at the earlier stages of their appointment, but may have stopped because highly engaged moderators were thoroughly answering the users' questions.

Moderators help foster an inclusive, respectful, and engaging environment for learners across the globe (Munday, 2016). Their role extends beyond mere oversight; it is a cornerstone in the effective management of online discussion boards, contributing significantly to the success of language learning programs and enhancing the overall learning experience (Lander, 2015). These findings may assist educators, researchers, and software developers in improving and providing assistance to learners from a wider range of moderators who may have different perspectives and skill sets.

Despite the insights gained, this study has limitations that should be acknowledged. Firstly, the analysis focused solely on moderator engagement levels without exploring the perspectives of learners themselves or the outcomes of these interactions on learner performance and satisfaction. Future research could include user surveys or interviews to provide a comprehensive understanding of the impact of moderator engagement on learner outcomes. Additionally, the study's netnographic approach, while valuable for observing online interactions, relied solely on publicly available data. Future studies could consider incorporating qualitative interviews with moderators to gain deeper insights into their motivations, challenges, and strategies in facilitating online discussions. Moreover, exploring the effectiveness of different moderation strategies in diverse cultural and linguistic contexts could further enrich our understanding of how moderators can

best support language learners from varied backgrounds. By addressing these areas in future research, educators, platform developers, and researchers can refine moderation practices to better support learners in online language learning environments.

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