





REVIEW ARTICLE



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# Exploring learning outcomes, communication, anxiety, and motivation in learning communities: a systematic review

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Learning communities have become a focal point of research due to their potential impact on learning outcomes, motivation, and communication. These factors are recognized as crucial determinants of the effectiveness of learning communities. To guide this study, a thorough review of 35 relevant studies was conducted, employing rigorous inclusion and exclusion criteria based on the PRISMA framework to ensure a systematic and robust approach. The findings of this study indicated that learning communities possess the capacity to enhance communication, motivation, and learning outcomes, while simultaneously alleviating learner anxiety. Specifically, it was observed that well-designed online learning communities can significantly improve learning outcomes. Furthermore, the utilization of online technologies within these communities can facilitate enhanced communication, leading to improved learning outcomes. Moreover, this study offers a range of recommendations for optimizing learning outcomes through the implementation of learning communities. These recommendations serve as valuable guidance for harnessing the full potential of learning communities to achieve educational goals. In conclusion, this study underscores the importance of learning communities in enhancing learning outcomes, motivation, and communication. It highlights the efficacy of appropriately designed online communities and the integration of technology in fostering effective communication and improving learning outcomes. The study contributes important insights into ways of maximizing the benefits of learning communities in promoting educational success.

## Introduction

In recent years, there has been a growing interest in both offline and online learning communities, which consist of professionals, shared goals, facilitators, and mechanisms, as well as the interconnectedness among these elements. These learning communities have shown potential in enhancing leadership, organization, and the ability to tackle various challenges (Wen and Zhang, 2020). Consequently, scholars have increasingly focused on investigating the impacts of learning communities on learning outcomes, motivation, and communication (Magana et al.,

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2021). These factors are considered important indicators of the effectiveness of learning communities. Notably, motivation and learning outcomes can be positively influenced through communication within learning communities. This is because strong motivation, coupled with frequent communication, facilitates intensive engagement with new knowledge and innovative information, consequently enhancing knowledge acquisition.

Anxiety plays a crucial role in learning communities and can impede effective communication and learning outcomes. Within a learning community, learners often face challenges related to imbalances in communication abilities and anxiety levels between experts and novices (Young et al., 2018). Novice learners may experience apprehension and reluctance to ask questions, leading to their withdrawal from active participation in learning activities within the community. Additionally, the dominance of experts within the learning community may exert pressure on other community members, hindering effective communication between teachers and learners. Particularly, anxiety, primarily experienced by novice learners, can have a detrimental impact on learning outcomes. The presence of anxiety can significantly influence learning outcomes, communication, and motivation within learning communities. Accordingly, this study aims to examine the role of anxiety and propose strategies to alleviate anxiety levels within learning communities.

This study complements the missing links in the scientific literature in the field of learning communities. Several academic studies have examined the efficacy of learning communities in the field of physical education (Parker et al., 2022), analyzed the impact of learning communities on online learning outcomes, and investigated the integration of learning communities with social networks in educational settings. Blayone et al. (2017) conducted research specifically on the influence of online learning communities on learning outcomes, while Schechter (2010) explored the role of social networks in educational contexts. Scanty review studies have synthesized the effects of learning communities on learning outcomes, communication, anxiety, and motivation. It aims to understand how communication, anxiety levels, and motivation impact students' learning outcomes in a community-based educational setting. The objective is to gather data on these variables and analyze the findings to provide insights on how to enhance learning experiences and outcomes within these communities. This systematic review study is meaningful and necessary since it aims to fill the research gap by identifying community-based learning outcomes, communication, anxiety, and motivation. The specific research questions are: (1) Can learning communities improve learners' communication? (2) Can learning communities improve learners' motivation? (3) Can learning communities mitigate learners' anxiety? and (4) How to improve learning outcomes through learning communities?

### Theoretical framework

Activity Theory is a theoretical framework that originated in the field of psychology and has gained prominence in various disciplines such as education, sociology, and human-computer interaction (Sukirman and Kabilan, 2023). It provides a lens to analyze and understand human actions within a social context. According to Activity Theory, human activities are not isolated events but are influenced by, and also influence, the social, cultural, and historical factors in which they occur. This theoretical perspective emphasizes that humans are active agents who engage in purposeful activities to achieve specific goals. Activities are seen as complex systems comprising multiple interconnected elements, including the subject (the individual or group engaged in the activity), the object (the goal or purpose of the activity), the

tools or artifacts used, the rules and norms governing the activity, the community or social setting in which the activity takes place, and the division of labor among participants.

Based on the activity theory, learning communities were conducive to language learning outcomes. Activity theory attempted to explore human-computer interactions based on the conception that a specific Activity could exert an influence on thinking, learning goals, reasons for doing, ways of doing, and learning methods. Activity theory provides a foundation for learning communities (Engeström, 2001). In a learning community, an individual activity could influence aspects of others. The positive or negative learning activity could exert a positive or negative influence on others' learning behaviors. It is thus important for community members to establish a model of positive activities to positively influence other language learners in the community.

Leading activities, community guidelines, and organized divisions of work could improve language learning effectiveness and inspire language learners and teachers (Isbell, 2018). In a learning community, teachers and designers could select learners who were actively engaged in learning activities and set them up as examples to be followed by other learners. Teachers and designers could also specify community guidelines to direct community members to appropriate learning directions and guide them to achieve success in language learning. Teachers could also organize learning activities and divide members into different teams where individuals assumed different responsibilities. In this way, teachers could improve members' language learning effectiveness and stimulate other members' learning enthusiasm.

The interplay between anxiety, communication, motivation, and learning outcomes within learning communities is a complex and dynamic process that can significantly impact the effectiveness of the educational experience. Anxiety can hinder effective communication and dampen motivation, ultimately impacting learning outcomes. On the other hand, positive communication can enhance motivation and learning outcomes, and intrinsic motivation supports effective communication and improved learning outcomes. Understanding these intricate dynamics can inform educators and policymakers in creating supportive learning environments that foster effective communication, reduce anxiety, and enhance motivation, leading to improved learning outcomes in learning communities.

### Literature review

**Definition of learning community.** To define learning community, it is valuable to refer to the works of Wenger-Trayner and Wenger-Trayner (2015) and Wenger (1998). These studies provide insights into the concept of learning communities. According to Wenger-Trayner and Wenger-Trayner (2015) and Wenger (1998), a learning community can be understood as a collective of individuals who share a common interest, engage in joint activities, and collaborate in a meaningful manner to enhance their learning and knowledge. It is characterized by mutual engagement, shared values, and a sense of belonging.

In a learning community, individuals come together to pursue their common goals, exchange ideas, and challenge one another intellectually. They often engage in regular interactions, such as discussions, collaborative projects, and sharing resources. Through these interactions, members of the learning community develop relationships, build trust, and establish a supportive environment that fosters continuous learning and development. The learning community is not restricted to a formal educational setting but can be found in various contexts, including workplaces, online platforms, or other social spaces. It transcends traditional hierarchical structures and encourages participation from individuals at different levels of expertise. Within a learning

community, newcomers are welcomed and supported in their learning journey, while experienced members serve as mentors or facilitators.

Central to the concept of a learning community is the notion of a “community of practice” as described by Wenger (1998). A community of practice refers to a group of individuals who share a domain of knowledge or field of practice and jointly learn through their interactions. Members of a community of practice engage in collective learning, negotiation of meaning, and the development of shared resources and practices. Drawing from Wenger-Trayner and Wenger-Trayner (2015) and Wenger (1998), a learning community can be defined as a social group of individuals who come together to pursue a common interest, engage in joint activities, and collaborate in a meaningful manner to enhance their learning and knowledge. It is characterized by mutual engagement, shared values, and a supportive environment that fosters continuous learning and development.

**Communication.** Learning communities have the potential to enhance learning outcomes through improved communication. Online learning communities offer teachers the chance to engage in activities related to English language teaching, enabling students to acquire language knowledge and engage in meaningful communication with their instructors (Pagan et al., 2020). Moreover, these communities provide teachers with a wealth of resources to adequately prepare for their teaching responsibilities. By connecting students and teachers from diverse social, cultural, and educational backgrounds, learning communities facilitate the exchange of suggestions, feedback, and mutual learning (Pagan et al., 2020). Consequently, online learning communities offer students living in isolated areas the opportunity to communicate with their teachers and interact with their peers, while teachers can employ flexible instructional approaches through online communicative technologies (Salazar, 2011).

Drawing upon the constructive attributes of learning communities, they serve as significant platforms for effective communication between school management, English language learners, and other stakeholders involved. These collaborative communities foster communication to redress inequities encountered by English language learners and also shed light on the dynamic interplay among schools, teachers, and students (Brooks et al., 2010). Therefore, by leveraging the benefits of learning communities, such as enhanced communication channels and the exchange of ideas, feedback, and resources, there is potential for improved learning outcomes for both teachers and students. Researchers thus propose the following research question:

**RQ1. Can learning communities improve learners’ communication?**

**Motivation.** Learning communities play a crucial role in improving learning outcomes by enhancing motivation. By creating a supportive and engaging environment, learning communities can motivate and activate students, while also fostering teachers’ professional development and shaping students’ perceptions within meaningful contexts (Pagan et al., 2020). In the context of learning Chinese as a foreign language, online learning communities have been found to effectively motivate students to engage in language learning (Cai and Zhu, 2012). In the case of Vietnamese students, who have limited opportunities to practice English oral skills, their motivation and interest in oral practice tend to be low. However, the use of social media within learning communities can bridge the gap between text-based learning and oral skills practice. Through the assistance of learning communities facilitated by social media platforms, students can engage in socio-cultural interactions and actively practice their oral English

skills. This is made possible due to the easy accessibility, flexible schedules shared resources, and collaborative attributes of learning communities (Duong and Pham, 2022). In general, learning communities hold the potential to foster desire and motivation within online or distance learning contexts. By providing a supportive and interactive environment, these communities play a vital role in enhancing engagement and motivation among learners.

Although learning communities for English teachers have shown potential in enhancing language learners’ communication and motivation, there are still discrepancies and contradictions between researchers and teachers, theoretical frameworks and practical implementation, and the integration of innovative designs and pedagogical practices. Within learning communities, teachers have the opportunity to raise pertinent questions, observe learners’ behaviors, analyze academic issues, propose inquiries, implement teaching strategies, reflect on their instructional practices, and address challenging problems (Yan and Yang, 2019). However, the extent to which teachers can effectively improve students’ communication skills and motivation within a learning community remains uncertain. Consequently, researchers have put forth the following research inquiries to explore this matter:

**RQ2. Can learning communities improve learners’ motivation?**

**Anxiety.** Learning communities have the potential to enhance learners’ interactions and alleviate their feelings of anxiety. Specifically, it has been observed that learning communities can improve the interactions among learners in a relaxed and informal setting, resulting in a reduction in learning anxiety among international students who are married to individuals residing in the United States (Grimm et al., 2019). By engaging in cooperative and interactive activities within a learning community, members are able to effectively address misunderstandings and misconceptions commonly encountered in foreign language education (Zhang, 2016). These close interactions redirect learners’ focus toward learning activities, thereby reducing psychological stress and increasing overall satisfaction. Furthermore, participation in a learning community allows learners and teachers to share a wealth of learning resources, which facilitates easy accessibility to materials and diminishes anxiety arising from concerns about making trivial mistakes or experiencing a lack of proficiency. Interactions with peers and instructors also aid in rectifying any misconceptions regarding key concepts. However, the effects of learning communities on interactions and anxiety have not been thoroughly explored through systematic review studies. Consequently, the following research questions have been proposed by the researchers undertaking this study:

**RQ3. Can learning communities mitigate learners’ anxiety?**

**Learning outcomes.** The establishment of virtual learning communities through the development of online learning platforms presents a promising approach to enhancing learning outcomes. One such example is the virtual intercultural avenues (VIA) program, which leverages social media, serious games, and other educational technologies to facilitate both online and physical learning and teaching within a learning community (Ren et al., 2016). Furthermore, the Discussion Forum of the GRE Analytical Writing Section, an online learning platform, has proven to be an effective tool for guiding students in practicing their writing skills within a learning community. Leveraging the theory of Community of Inquiry, the platform fosters social presence, teacher

presence, and cognitive presence, ultimately leading to an improvement in students' analytical writing skills (Sun et al., 2017).

The Theory of Community of Inquiry is a theoretical framework that focuses on the process of creating meaningful and transformative learning experiences in online and blended learning environments. According to Yu and Li (2022), this theory emphasizes the importance of social presence, cognitive presence, and teaching presence in fostering a deep and engaged learning community. According to this theory, social presence refers to the extent to which participants in an online community perceive each other as real and as connected individuals. It involves establishing trust, building relationships, and engaging in open communication to create a sense of belonging and connectedness. Cognitive presence refers to the depth of critical thinking, reflection, and inquiry that occurs within the learning community. It involves the exploration of complex problems, the application of higher-order thinking skills, and the construction of new knowledge and understanding. Teaching presence encompasses the design, facilitation, and direction of the learning experience by the instructor or facilitator. It includes instructional design, facilitating discourse, and providing direct instruction as necessary to guide and support learners' engagement and achievement of learning goals.

The Theory of Community of Inquiry suggests that all three elements (social presence, cognitive presence, and teaching presence) are interconnected and essential for the creation of a rich and meaningful learning experience. By fostering a sense of community, promoting active and reflective learning, and providing effective teaching, this theory aims to optimize the online and blended learning environment to support deep and transformative learning outcomes. The online learning platform such as Gather.Town could enhance students' engagement and interactions in foreign language learning by establishing a learning community (Zhao and McClure). To explore how to improve learning outcomes through learning communities, researchers proposed the research question as follows:

#### **RQ4. How to improve learning outcomes through learning communities?**

#### **Research methods**

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework is a widely recognized and utilized tool for conducting and reporting systematic reviews and meta-analyses in academic research. The PRISMA framework offers a comprehensive set of guidelines to ensure transparency and rigor in the review process, enhancing the credibility and reproducibility of the study findings. The PRISMA framework comprises a 27-item checklist and a four-phase flow diagram, which serve as valuable resources to guide researchers through each stage of the review process. These stages include the identification and selection of relevant studies, the extraction and synthesis of data, the assessment of study quality and bias, and the reporting of the results. The checklist addresses key components such as the design and objectives of the review, the search strategy and inclusion criteria, the data extraction process, and the assessment of the risk of bias in included studies.

By adhering to these guidelines, researchers can ensure a thorough and systematic approach to their review, minimizing the likelihood of bias and enhancing the reliability of the study findings. Furthermore, the PRISMA flow diagram visually depicts the flow of information throughout the review process, from the initial identification of studies to the final inclusion or exclusion of articles. This diagram allows readers to understand the selection process and identify any potential biases or gaps in the review. The PRISMA framework serves as a valuable tool for

researchers undertaking systematic reviews and meta-analyses. Its comprehensive checklist and flow diagram promote transparency, rigor, and consistency in the review process, ultimately enhancing the validity and reliability of the study findings.

This systematic review study was implemented based on the protocol of PRISMA (Page et al., 2021). The review study was not registered since it did not involve any human or animal participants and was approved by the Academic Board of the University. Researchers recruited three raters to include and exclude the studies obtained from various online databases. Two raters independently included and excluded the studies based on both inclusion and exclusion criteria. The inter-rater reliability was measured to ensure both raters reached a satisfactory degree of agreement on their decisions.

Raters independently extracted data from the included studies using the finalized data extraction form. Three reviewers performed the extraction to minimize errors and biases. Any discrepancies between the reviewers were resolved through discussion or consultation with another reviewer. They assessed the quality and risk of bias of each included study using established tools, such as the Cochrane Collaboration's risk of bias tool or the Newcastle-Ottawa Scale. This step helps inform the interpretation of the results and enhances the robustness of the systematic review.

To assess the quality and risk of bias of each included study, raters understood the specific criteria and domains assessed and then obtained all relevant information from the included studies, such as study protocols, methods, data, and results. They identified the key domains or criteria used in the assessment tool to evaluate the quality and risk of bias in the studies and evaluated each included study individually based on the identified domains and criteria. After carefully reviewing the information provided in the publication(s) of the study, including methods sections, tables, figures, and supplementary materials, they used the assessment tool to assign ratings or scores for each domain or criterion being evaluated. They justified the ratings for each domain or criterion, summarized the overall risk of bias for each included study, highlighted specific areas where bias might be present, and considered the implications of the assessed risk of bias on the study findings and the strength of evidence.

Raters included the studies based on the following inclusion criteria. Firstly, they should belong to the scope of learning outcomes, communication, anxiety, and motivation in learning communities. Secondly, they should be of higher quality based on the assessment of a systematic review, i.e. Step 6: Assess Quality of Included Studies (<https://guides.lib.unc.edu/systematic-reviews/assess-quality>) detailed in University Guidelines in the University of North Carolina at Chapel Hill. Two raters scored each included scientific literature based on a 5-point system. The final score of each was calculated as the mean of the two raters' scores. They scored the included studies according to the questions proposed to evaluate their relevance, reliability, validity, and applicability (Appendix A). Thirdly, the included studies should be able to provide enough data for a systematic review. For instance, they should provide convincing results and evidence to support their findings.

Researchers also established exclusion criteria to exclude the literature. The literature will be excluded if they are poorly scored or designed. They will exclude editorials, notes, short surveys, reference work entries, news, datasets, duplicated documents, withdrawn works, corrections, and those out of the scope of the learning community. They also excluded those without abstracts, rigid design, a proper sample size, or adequate data, as well as those failing to provide enough convincing results and evidence. Two raters will exclude the literature based on the criteria with the measurements of inter-rater reliability. A third rater will also

decide the results if both raters cannot reach an agreement on any decision.

Researchers obtained scientific literature from multiple online databases according to their specific syntactic rules. Specifically, they retrieved 2065 results on August 16, 2022 by keying “learn\* outcome\* OR communicat\* OR anxiety OR motivat\* (topic) and “learn\* communit\* (topic) in the search column in Web of Science including article ( $n = 1433$ ), conference paper ( $n = 656$ ), others ( $n = 63$ ), online first ( $n = 37$ ), reviews ( $n = 34$ ), abstracts ( $n = 16$ ), books ( $n = 3$ ), etc. This online database includes the Core Collection of Web of Science, China Sciences Citation Index, Derwent Innovations Index, KCI-Korean Journal Database, MEDLINE®, and SciELO Citation Index.

They obtained 2236 results by keying (TITLE-ABS-KEY (“learn\* outcome\* OR communicat\* OR anxiety OR motivat\*”) AND TITLE-ABS-KEY (“learn\* communit\*”)) in the search column of Scopus, including article ( $n = 1269$ ), conference paper ( $n = 644$ ), and book chapter ( $n = 177$ ), review ( $n = 87$ ), book ( $n = 24$ ), conference review ( $n = 24$ ), note ( $n = 5$ ), editorial ( $n = 3$ ), and short survey ( $n = 1$ ). The discipline included Social Sciences ( $n = 1485$ ), computer science ( $n = 892$ ), engineering ( $n = 336$ ), arts and humanities ( $n = 141$ ), mathematics ( $n = 125$ ), psychology ( $n = 107$ ), business, management and accounting ( $n = 100$ ), medicine ( $n = 90$ ), decision sciences ( $n = 51$ ), and physics and astronomy ( $n = 38$ ). The literature search was carried out on August 16, 2022.

They obtained 46 result(s) for ‘(communication OR anxiety OR motivation OR learning OR community)’ in Springer by entering terms, i.e. “with at least one of the words: communication anxiety motivation learning community” and “where the title contains: learning outcome”. The content type included article ( $n = 26$ ), chapter ( $n = 16$ ), conference paper ( $n = 13$ ), and reference work entry ( $n = 4$ ). The discipline included education ( $n = 20$ ), computer science ( $n = 18$ ), engineering ( $n = 2$ ), psychology ( $n = 2$ ), and biomedicine ( $n = 1$ ). The obtained results were all written in English and the search was implemented on August 16, 2022.

They obtained 227 results for [Keywords: communication or anxiety or motivation or learning outcome] and [Title: learning community] in Sage. The article type included article-commentary ( $n = 1$ ), research-article ( $n = 191$ ), review-article ( $n = 8$ ), case-report ( $n = 3$ ), and others ( $n = 24$ ), ranging from 1981 to 2022. The discipline included geography ( $n = 2$ ), public health ( $n = 23$ ), engineering & computing ( $n = 3$ ), marketing & hospitality ( $n = 1$ ), and economics & development ( $n = 5$ ). Researchers carried out the search on August 16, 2022.

They obtained 18 results by keying in “Find articles with these terms: communication or anxiety or motivation or learning outcome, and “Title: learning community” in Elsevier ScienceDirect. The article type included review article ( $n = 1$ ), research article ( $n = 15$ ), encyclopedia ( $n = 1$ ), and book chapter ( $n = 1$ ). The publication titles included Computers & Education ( $n = 2$ ), The Internet and Higher Education ( $n = 2$ ), and Nurse Education Today ( $n = 2$ ). Subject areas included social sciences ( $n = 13$ ), nursing and health professions ( $n = 4$ ), psychology ( $n = 4$ ), business, management and accounting ( $n = 2$ ), arts and humanities ( $n = 1$ ), earth and planetary sciences ( $n = 1$ ), and medicine and dentistry ( $n = 1$ ). After the inclusion and exclusion, researchers included a total of 35 studies in this systematic review study (Fig. 1).

The included studies ( $n = 35$ ) guided the study. They underwent inter-rater selection after the inclusion and exclusion process based on the criteria. Two raters extracted necessary information and data from included studies using content analysis methods (Hsu et al., 2013). They adopted Cohen’s kappa statistics to evaluate the inter-rater reliability coefficient

(Cohen, 1968). The inter-rater reliability reached a satisfactory level ( $k = 0.92$ ). Raters extracted data such as authors, publication years, names of sources, and major findings that might guide this systematic review study (Table 1).

The selected studies for this systematic review were chosen following the PRISMA framework, which ensures a comprehensive and transparent selection process. To ensure completeness, a thorough search of relevant databases was conducted, capturing a wide range of studies related to learning communities and their effects on communication, motivation, and learning outcomes. The inclusion criteria encompassed studies from various contexts, such as different educational levels, institutions, and countries.

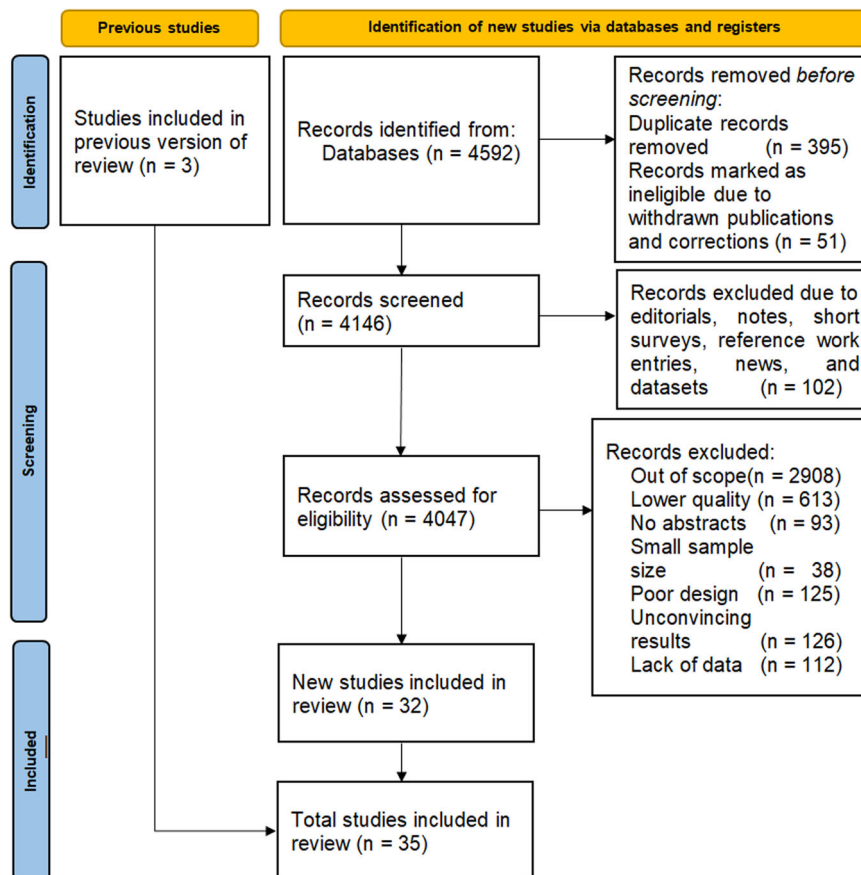
To address the representativeness of the selected studies, efforts were made to include studies with diverse socio-demographics. This was achieved by including studies conducted in various socio-economic settings, encompassing different geographical regions, cultural backgrounds, and geographic locations. Additionally, studies were included that involved learners from different age groups, ethnicities, and educational backgrounds, ensuring a comprehensive representation of socio-demographic diversity. By incorporating studies from diverse socio-demographic backgrounds, this systematic review aims to provide a more comprehensive and holistic understanding of the effects of learning communities on communication, motivation, and learning outcomes.

## Results and discussion

**RQ1 Can learning communities improve learners’ communication?** Most studies reported that learning communities could improve learners’ communication. Communication was a fundamental ability that could reflect learners’ academic achievements in online learning communities. Virtual communities could provide private and social media-based platforms for students to communicate with peers or teachers to share their opinions, propose questions, and obtain timely feedback from teachers (Corbo et al., 2016). Various roles of students may greatly facilitate communication in learning communities. Different roles of students and teaching in learning communities could exert a great influence on the communicative pedagogical approach and learning experiences (Puigdellivol et al., 2017). Teachers could integrate the roles and cater different learning tasks to different individuals. Various kinds of learning communities, assisted with mobile technologies, could enhance communicative skills, improve self-directed learning management, and reduce addictions to social media and cyber-bullying behaviors (Furdu et al., 2015). In this way, learners could improve communication through digital technologies (de Witt, 2011).

Various factors in learning communities could improve learners’ communicative ability. Virtual and physical learning communities could both improve communicative skills via organized learning activities (Young, 2002). School leadership could activate teachers’ learning communities and establish organized interactions to improve cultural knowledge acquisition, teaching skills, and communicative ability (Shin and Choi, 2018). Both students and teachers with video annotation tools could improve their communicative skills and reflective thinking ability by reducing communicative hindrance, avoiding the revelation of students’ weaknesses, and contextualizing the written notes in videos (Shek et al., 2021). Based on computer-assisted communication, teachers could dominate learning activities and promote cooperation and interactions between students and teachers in learning communities (Zhao et al., 2019).

Communication in learning communication is conducive to learning outcomes. Communicative ability, an important factor that could influence learning communities, could in turn



**Fig. 1 An inclusion and exclusion flow chart of scientific literature.** This is a diagram that visually displays the process of selecting and filtering relevant scientific literature.

influence students' self-regulation, collaborative learning ability, problem-solving skills, and learning outcomes (Park and Hee, 2022). The activity level and communicative skills in learning communities were positively related to learning outcomes (Seo and Eun-Young, 2018). Frequent communication, a strong sense of presence, and favorable relationships could greatly improve learning outcomes based on learning communities (Seckman, 2018). Social communication occurred frequently in virtual learning communities, where the forum provided opportunities for members to post opinions and answer questions conveniently and concisely (Reyes and Tchounikine, 2004). Frequent communication could increase the contacts of knowledge, and thus improve learning outcomes.

Learning communities have the potential to enhance learners' communication skills. Studies have shown that by participating in learning communities, students are provided with opportunities for collaborative learning, active engagement, and communication with peers and instructors. These interactions facilitate the exchange of ideas, discussions, feedback, and constructive criticism, contributing to the development of effective communication skills. Additionally, the integration of social networks within learning communities can further promote communication by providing an online platform for interaction and collaboration. Therefore, it can be argued that learning communities have a positive impact on learners' communication abilities.

#### RQ2 Can learning communities improve learners' motivation?

The majority of studies revealed that virtual learning communities could enhance learners' motivation. Virtual learning

communities could have a positive impact on learners' motivation for Chinese language education (Cai and Zhu, 2012). Living-learning communities could improve learners' motivation and enhance their skills in adopting motivational strategies. The honors community could more significantly motivate students to learn than science and engineering communities (Faber et al., 2014). The features of teachers in learning communities, e.g. shared vision and contextual sustainability, could exert a great influence on students' motivation in learning activities (Kim and Jung, 2018). Interpersonal connections and a sense of belonging could motivate students to engage in learning activities in virtual learning communities (Lopez de la Serna et al., 2021). Learning communities could enhance the sense of communities, improve learning quality, enhance learning engagement, increase course satisfaction, and foster learning motivation (Lee, 2021).

Learning communities could foster learners' motivation via the improvement in collaboration, interactions, satisfaction, and self-efficacy. Collaborative and social interactive models based on self-determination theory could cultivate a learning climate motivating students to engage in listening practice in learning communities (Ng and Latife, 2022). Students who joined the learning communities tended to possess higher levels of satisfaction, self-efficacy, and motivation than those who did not (Park et al., 2019). Learners' self-efficacy, learning strategies, and intrinsic motivation played important roles in the persistence of learning behaviors in online learning communities (Park and Bong, 2022). Teachers' self-efficacy could exert a great influence on their motivational regulation, perceived teaching values, and engagement in online professional learning communities (Zhang and Liu, 2019).

**Table 1 Details of included studies.**

No.	Authors/years	Name of sources	Major findings
1	Corbo et al. (2016)	Physics Education Research Conference	Virtual communities could provide private and social media-based platforms for students to communicate.
2	Puigdellivol et al. (2017)	Disability & Society	Different roles of students and teaching in learning communities
3	Furdu et al. (2015)	International Conference on Social Media in Academia - Research and Teaching	Learning communities can enhance communication.
4	de Witt (2011)	Zeitschrift Fur Padagogik	Learners could improve communication through digital technologies.
5	Young (2002)	International Conference on Computers in Education	Virtual and physical learning communities could improve communicative skills.
6	Shin and Choi (2018)	The Journal of Korean Teacher Education	School leadership could improve communicative ability.
7	Shek et al. (2021)	Education and Information Technologies	Both students and teachers could improve their communicative skills through learning communities.
8	Zhao et al. (2019)	RELC Journal	Teachers could dominate learning activities and promote interactions in learning communities.
9	Park and Hee (2022)	The Journal of Learner-Centered Curriculum and Instruction	Communicative ability could influence learning communities.
10	Seo and Eun-Young (2018)	The Journal of Learner-Centered Curriculum and Instruction	The communicative skills in learning communities were positively related to learning outcomes.
11	Seckman (2018)	Nurse Educator	Frequent communication could greatly improve learning outcomes based on learning communities.
12	Reyes and Tchounikine (2004)	7th International Conference on Intelligent Tutoring Systems	Social communication occurred frequently in virtual learning communities.
13	Cai and Zhu (2012)	Foreign Language Annals	Virtual learning communities could have a positive impact on learners' motivation.
14	Faber et al. (2014)	2014 ASEE Annual Conference	The honors community could motivate students to learn.
15	Kim and Jung (2018)	The Journal of Learner-Centered Curriculum and Instruction	The features of teachers in learning communities greatly influence students' motivation.
16	Lopez de la Serna et al. (2021)	EDMETIC	Interpersonal connections and sense of belongings could increase motivation in learning communities.
17	Lee (2021)	Business Communication Research and Practice	Learning communities could foster learning motivation.
18	Ng and Latife (2022)	International Journal for Lesson and Learning Studies	Collaborative and social interactive models could motivate students in learning communities.
19	Park, Dong et al. (2019)	The Journal of Learner-Centered Curriculum and Instruction	Students who joined the learning communities tended to possess higher levels of motivation.
20	Park and Bong (2022)	Research on Humanities and Social Sciences	Learners' intrinsic motivation played important roles in online learning communities.
21	Zhang and Liu (2019)	Computers & Education	Teachers' self-efficacy could influence motivational regulation in online learning communities.
22	MacKenzie et al. (2010)	Teaching in Higher Education	A year-long learning community could reduce the anxiety of university lecturers.
23	Karpenko et al. (2021)	Journal of Dental Education	Virtual learning communities improve learning environments.
24	Intasingh (2019)	6th International Conference of Science Educators and Teachers	Learning communities could reduce anxiety.
25	Celik and Yesilyurt (2013)	Computers & Education	Computer anxiety could negatively influence learning outcomes in learning communities.
26	Hilliard et al. (2020)	Computers & Education	The anxiety might be reduced in learning communities.
27	Insaard and Netwong (2015)	9th International Technology, Education and Development Conference	Online learning platforms could foster learning motivation.
28	Halkias and Mills (2008)	Proceedings of the 12th WSEAS International Conference on Computers	The online learning platform could improve language learning skills in learning communities.
29	Stoytcheva (2017)	43rd International Conference Applications of Mathematics in Engineering and Economics	The online learning platform provides plentiful learning resources through learning communities.
30	Chou et al. (2014)	Academic Medicine	The communication in learning communities could improve learning outcomes.
31	Karo and Petsangsri (2021)	Education and Information Technologies	The online platform could improve communication through cloud learning communities.
32	Kamihira et al.(2011)	2nd International Conference on Human-Centered Design	Communication through learning communities could improve cross-cultural communication.
33	Parker et al. (2022)	European Physical Education Review	Learning communities could improve physical educational outcomes.
34	Blayone et al. (2017)	International Journal of Educational Technology in Higher Education	Online learning communities could benefit learning outcomes.
35	Schechter (2010)	Teachers College Record	Despite the positive effect of learning communities on learning outcomes, researchers could still explore the social networks used in education.

Learning communities can have a positive effect on learners' motivation. Engaging in a learning community provides a sense of belongingness and support, which can increase learners' motivation to actively participate in their learning process. Being part of a community creates a social connection that fosters intrinsic motivation and a desire to achieve goals. Learning communities often emphasize collaboration and peer support, which can enhance motivation through the encouragement and inspiration provided by peers. In a community setting, learners can share their successes, challenges, and progress, creating a positive and motivating environment. Furthermore, learning communities can offer additional resources, such as access to mentors or experts, which can increase learners' motivation by providing them with guidance and support. The availability of these resources and the opportunity for meaningful interactions within a learning community can inspire learners to persist in their learning journey and achieve their goals. Generally, learning communities create a supportive and collaborative environment that promotes motivation and engagement, leading to improved learning outcomes.

### **RQ3 Can learning communities mitigate learners' anxiety?.**

Numerous studies demonstrated that both offline and online learning communities could reduce learners' anxiety. A year-long learning community could facilitate collaboration and reduce the anxiety of university lecturers in the UK (MacKenzie et al., 2010), leading to lower levels of anxiety among learners. Virtual learning communities could improve learning environments for dental school students and enhance their engagement in dental education by reducing anxiety and stress (Karpenko et al., 2021). In addition, professional learning communities could reduce teachers' anxiety via training and online courses (Intasingh, 2019). Teachers with less anxiety could transfer the relaxing atmosphere to learners, which might result in reduced learner anxiety in learning communities.

Learner anxiety could be mitigated through collaboration in learning communities. Collaborative learning in learning communities could also cause learner anxiety, especially when learners are aware that their learning achievements would be evaluated and compared with their peers. The learner's anxiety could, in turn, negatively influence their participation and motivation in learning through learning communities. Computer anxiety could negatively influence learning outcomes in computer-supported learning communities (Celik and Yesilyurt, 2013). However, frequent interactions could acquaint learners with their environments. With the learning process through learning communities, learners might be increasingly familiar with their peers and competitive environments. Their anxiety might thus be reduced and learning outcomes and coping strategies might be enhanced in learning communities (Hilliard et al., 2020).

Learning communities can help mitigate learners' anxiety. Learning can often be challenging and overwhelming, leading to feelings of anxiety and stress. However, being part of a learning community can alleviate these negative emotions by providing a supportive and collaborative environment. By interacting with peers who share similar learning experiences and challenges, learners realize they are not alone in their struggles. This sense of shared experience and commonality can help reduce anxiety by providing reassurance and support. Learning communities can also offer opportunities for collaboration and peer learning, which can help alleviate anxiety by distributing the workload and fostering a sense of shared responsibility. When learners work together and support one another, the burden of learning may seem less daunting, reducing anxiety levels. Additionally, learning

communities often promote a growth mindset, emphasizing the idea that intelligence and skills can be developed over time with effort and practice. This mindset can help alleviate anxiety by reducing the fear of failure and fostering a more positive perception of learning. Consequently, learning communities can provide a nurturing and supportive environment that helps mitigate learners' anxiety by promoting shared experiences, collaboration, and a growth mindset.

### **RQ4 How to improve learning outcomes through learning communities?.**

Properly designed online learning communities could improve learning outcomes in various aspects. Online learning platforms could establish learning communities through advanced communicative technologies. Online learning platforms, e.g. IRC Français, could improve foreign language learning effectiveness through learning communities, improve digital literacy, enhance self-efficacy, facilitate knowledge acquisition, and foster learning motivation (Insaard and Netwong, 2015). Online learning platforms such as the Hellenic American Union in Greece could improve second language learning skills through learning communities (Halkias and Mills, 2008). Online learning platforms such as UNIV-RCT could provide plentiful learning resources through learning communities to improve problem-solving skills, enhance collaborative learning ability, and maintain French language proficiency (Stoytcheva, 2017). Communication in learning communities could enhance individual awareness, team collaborative skills, and learning outcomes via online interactions (Chou et al., 2014).

Communication, enhanced through online technologies, could increase learning outcomes. The online platform could improve communication through cloud learning communities and the online teaching was effective through professional learning communities (Karo and Petsangri, 2021). Bilateral communication through learning communities could improve learning outcomes. Communication through learning communities could improve cross-cultural communication and learning experiences (Kamihira et al., 2011). The computer-assisted communication through learning communities could increase virtual engagement and social and cognitive presence. Communication is an indispensable factor that may facilitate learning community-assisted learning and teaching. Teachers, developers, and course designers could pay special attention to the ways to enhance communication through online communicative technologies.

Improving learning outcomes through learning communities involves creating a supportive and collaborative environment that fosters engagement, participation, and active learning. Educators can encourage learners to interact with each other through group discussions, collaborative projects, or online forums. This interaction allows for the exchange of ideas, diverse perspectives, and constructive feedback, which can deepen understanding and enhance learning. They can encourage learners to actively engage with course materials and concepts through problem-solving activities, case studies, hands-on experiments, or simulations. This active learning approach promotes critical thinking, application of knowledge, and a deeper understanding of the subject matter. They can create opportunities for learners to connect with each other, such as icebreaker activities, regular check-ins, or social events. Foster a culture of inclusivity, respect, and support to create a safe space for learners to express their ideas, ask questions, and seek help when needed. They can offer clear learning objectives, guidelines, and resources to support learners' progress. They can promote self-reflection and self-assessment practices to help learners monitor their progress, identify areas where they need improvement, and set goals for growth.



In addition, a well-designed online learning community can significantly improve learning outcomes through collaboration and interaction, peer-to-peer learning, timely feedback and support, a sense of belonging and motivation, personalized learning opportunities, access to diverse perspectives and resources, and flexibility and convenience.

Online learning communities facilitate collaboration and interaction among learners. By incorporating discussion forums, group projects, and virtual classrooms, learners can engage with and learn from one another in a collaborative manner. This active involvement promotes a deeper understanding of the subject matter.

Online learning communities facilitate peer-to-peer learning where learners can share their knowledge, experiences, and perspectives with their peers. Engaging in meaningful discussions and exchanging insights can enhance understanding and promote critical thinking among learners.

A well-designed online learning community provides timely feedback and support mechanisms, such as instructor feedback, peer assessment, and virtual office hours. These elements enhance comprehension, allow for clarification of doubts, and improve overall engagement with the learning materials.

By creating a supportive and inclusive environment, a well-designed online learning community fosters a sense of belonging among learners. This feeling of community helps motivate learners to actively participate, persist in their studies, and strive for better learning outcomes.

Online learning communities can offer personalized learning opportunities through adaptive learning technologies, individualized assignments, and tailored resources. Such customization allows learners to focus on their specific learning needs and preferences, leading to better comprehension and retention of the material.

Online learning communities often bring together learners from different regions, cultures, and backgrounds. This diversity provides learners with exposure to different perspectives and ideas, broadening their understanding and enriching their learning experience.

Online learning communities offer the flexibility to access learning materials and engage with fellow learners at any time and from anywhere. This convenience allows learners to adapt their learning to their individual schedules and preferences, resulting in enhanced engagement and better learning outcomes.

To sum up, a well-designed online learning community enables collaboration, promotes peer-to-peer learning, provides timely feedback and support, fosters a sense of belonging, offers personalization, exposes learners to diverse perspectives, and provides flexibility. These elements collectively contribute to significant improvements in learning outcomes.

### **Deeper insights into learning communities and related factors.**

Learning communities are social environments where individuals come together to learn, share knowledge, and support each other's learning journeys. Online learning communities specifically refer to these communities facilitated through digital platforms, enabling learners from different locations to connect and collaborate virtually. Deep insights into learning communities and related factors can be further explored.

Social constructivism is an important element to be included in learning communities. Learning communities are based on the principle of social constructivism, which suggests that knowledge is actively constructed through social interactions and collaboration. In a learning community, learners engage in discussions, share ideas, and collectively build knowledge through their interactions.

Sense of community plays an important role in community-based learning. A crucial aspect of learning communities is the development of a sense of community among members. The feeling of belonging, shared goals, and support within the community fosters a positive learning environment. The sense of community encourages active participation, cooperation, and a sense of accountability among learners.

Active learning is facilitated in communities. Learning communities promote active learning rather than passive consumption of information. Learners are encouraged to contribute, ask questions, and critically engage with the learning content. This active participation enhances comprehension, retention, and application of knowledge.

Roles of facilitators are essential in learning communities. Facilitators play a significant role in online learning communities by guiding and supporting learners. They create a structured framework, facilitate discussions, provide feedback, and encourage participation. Skilled facilitators can effectively nurture a collaborative learning environment and address individual learning needs.

Peer learning and support are considered important factors in learning communities. Peer learning is an essential component of learning communities. Learners can benefit from the diverse knowledge, experiences, and perspectives of their peers. Peer feedback, collaboration on projects, and collective problem-solving contribute to deeper learning and skill development.

Reflection and metacognition are considered important elements in learning communities. Learning communities encourage learners to reflect on their learning experiences and engage in metacognition, which involves thinking about their thinking. Reflection helps learners consolidate their understanding, identify areas for improvement, and set goals for further learning.

Technology and digital tools can be used in learning communities. Online learning communities heavily rely on technology and digital tools to facilitate communication, collaboration, and access to resources. Learning management systems, communication platforms, multimedia resources, and online forums support and enhance the learning experience within the community.

Lifelong learning and professional development cannot be sustained without learning communities. Learning communities provide opportunities for lifelong learning and continuous professional development. Learners can stay updated with the latest knowledge and trends in their field, acquire new skills, and build professional networks within the community.

Motivation and engagement are important factors influencing the effect of learning communities. Engaging and motivating learners is crucial for the success of learning communities. Incorporating gamification elements, interactive activities, and recognition of achievements can enhance learner motivation and sustain engagement over time.

Assessment and evaluation are important measurements to secure the development of learning communities. Learning communities employ various methods of assessment and evaluation to measure learning outcomes. These may include quizzes, assignments, peer evaluations, and self-assessments. The feedback received through assessments helps learners identify areas for improvement and guide future learning efforts.

In conclusion, learning communities foster active learning, collaboration, peer support, and reflection. Skilled facilitators, technology, and an effective sense of community contribute to creating an engaging and supportive learning environment. By focusing on these factors, learning communities can significantly enhance the learning outcomes and overall learning experience for individuals.

**Recommendations for optimizing community-based learning outcomes.** Building a strong sense of community, fostering active collaboration, and facilitating meaningful connections are key to optimizing community-based learning outcomes. A sense of belonging can facilitate community-based learning. Create an inclusive and welcoming learning community that values and respects the contributions of all members. Encourage learners to actively participate and engage in discussions, promoting a sense of belonging and ownership within the community. This can enhance motivation and commitment to learning.

Active collaboration is an important factor in the success of community-based learning. Design learning activities that promote active collaboration among community members. Assign group projects, discussion forums, and peer-to-peer mentoring programs to encourage learners to work together, share knowledge, and learn from each other. This collaborative approach enhances critical thinking, problem-solving skills, and a deeper understanding of the subject matter.

It is important to cultivate meaningful connections between community members. To promote mentorship, professional development, and access to a broader range of knowledge and resources, learners should be encouraged to establish meaningful connections with their peers, facilitators, mentors, and industry professionals within the community. This can be facilitated through various opportunities such as networking events, guest lectures, and virtual meet-ups.

## Conclusion

**Major findings.** This study presents a systematic review based on the PRISMA framework, finding that the utilization of learning communities can yield enhancements in communication, motivation, and learning outcomes, along with a reduction in learners' anxiety. It is suggested that well-designed online learning communities have the potential to improve learning outcomes, while the integration of online technologies can further augment communication and subsequently enhance learning outcomes within learning communities. Additionally, the researchers put forward several suggestions aimed at enhancing learning outcomes through the implementation of learning communities.

**Limitations.** Although this study is rigidly designed, this study is limited to several aspects. Firstly, this study could not leverage all the publications due to the limitation of library resources. Secondly, this study undertakes a systematic review without sufficient quantitative data support. The number of included studies is limited to 35, which is insufficient to underpin the conclusion in the absence of quantitative data. Lastly, there may be other factors excluded from this study that may need further investigation in the future.

**Implications for future research.** Future research could integrate entertainment elements into learning communities. Serious games could stimulate learners' interest and promote their learning motivation by integrating entertainment into learning communities (Tam, 2022). Learners could play serious games with team members and subconsciously acquire knowledge embedded in the games and plots. Teachers could guide students to focus on how to achieve goals in the games and students struggled with fun in the gameplay. The difficulty in entertainment-based learning communities may lie in the development and design of serious games for adult learners. Future researchers could be devoted to the creation of serious games with interdisciplinary efforts.

Educational administrators could consider including the element of learning communities-based learning and teaching

in the future. Some countries and areas have implemented this educational policy. For instance, learning communities were included as an important educational policy in Scotland (Hancock and Hancock, 2021). The learning community organization may need administrators to coordinate between different individuals and institutions. Individuals may possess different personality traits and preferences. Coordinators need to meet different demands and establish a harmonious learning community. Teachers could account for the goals and process of learning community-based learning and encourage learners to participate in the learning activities. The formation of learning communities may be confronted with unexpected challenges.

Future teachers could combine traditional pedagogy with learning communities, especially in language education. For instance, the combination of a popular teaching model with learning communities could leverage educational technologies and improve community-assisted Spanish language learning outcomes. The learning community could cultivate a Spanish language learning space for students and teachers to interact with each other and solve difficult problems (Overfield, 2003). In a learning community, students could enhance their interactions and communication with peers and teachers to improve their language practice skills. They could also foster their critical thinking ability through the learning community.

Advanced technologies and digital literacy could better the learning community-based learning outcomes in the future. Learning technologies and innovative pedagogies could improve language learning by establishing a cyber-learning community via a flipped pedagogical approach. The online technologies could make learning communities easily established, together with smooth communication. The learning communities could improve meaningful and collaborative learning, increase the opportunities for oral skill practice, and enhance language learning engagement through various learning activities such as role play, storytelling, discussion, and presentation (Wu et al., 2017). Future development of learning community-based learning may largely depend on the development of information technologies and digital literacy of learners and teachers.

Future research could highlight how to improve task distribution and collaborative teaching in learning communities. For instance, in learning communities of English teachers, teachers played different roles and presented different identities, and they engaged in a higher proportion of reasoning teaching with lower distributed participation and less collaborative teaching (Cheng and Pan, 2019). It may be the important task of teachers to allot appropriate assignments to different team members in the learning community. Teachers could also encourage members' collaboration in learning and improve the learning process. They could also provide timely feedback on students' complaints or suggestions. Students should hold a positive attitude towards collaborative learning in a community.

Future research could focus on how to improve students' metacognition in a learning community. Community metacognition could improve communication among tertiary learners in Chungbuk University in learning communities. Students with higher levels of metacognition could adopt a cooperative strategy to learn in a community because they might be aware of the importance and benefits of community-based learning. They would collaborate with peers and teachers by raising questions and solving problems. On the contrary, those with lower metacognition could not perceive the benefits of learning communities and could thus refuse to collaborate with members or teachers. They would likely prefer individual learning, which might not benefit the learning outcomes.

Future research could also focus on gender differences in the sense of learning and attitudes toward privacy in learning

communities. Females held a significantly stronger sense of learning and felt more comfortable with personal information revelation than their counterparts (Ozturk and Deryakulu, 2011). Learning attitudes could exert a great influence on learning outcomes in the context of learning communities (Eftimie, 2013). Positive attitudes could increase learning outcomes in the context of learning communities. Future researchers could make every effort to cater to different preferences in learning communities and improve community-based learning outcomes by adopting appropriate teaching strategies. This might pose great challenges to teachers and designers in the future.

### Data availability

The datasets generated during and/or analyzed during the current study are openly available in the [OSF] repository, [[https://osf.io/m697t/?view\\_only=a3c261407d83424f93ddcfcfece607a3](https://osf.io/m697t/?view_only=a3c261407d83424f93ddcfcfece607a3)].

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## Author contributions

WC collected data, analyzed data, revised and confirmed the paper. ZY acquired the funding and conceptualized the study.

## Competing interests

The authors declare no competing interests.

## Ethical approval

The research was approved by the academic committee of the Faculty of Foreign Studies of Beijing Language and Culture University (Grant No. 20231037). The research was performed where no human participants were involved.

## Informed consent

This article does not contain any studies with human participants performed by any of the authors.

## Additional information

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