International Journal of Learning, Teaching and Educational Research
Vol. 23, No. 2, pp. 402-420, February 2024
https://doi.org/10.26803/ijlter.23.2.19
Received Jan 5, 2024; Revised Feb 23, 2024; Accepted Mar 6, 2024

Insights into the Dynamic Relationship between Technology and Task-Based Language Teaching: A Critical Review

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Abstract. The advent of new technologies and educational tools, while undoubtedly exciting, can often lead their being a mere source of entertainment unless their design, deployment and assessment are grounded in the principles of educational and language development. The task-based language teaching approach, along with its theoretical premises in task-based language learning, offers an excellent opportunity to leverage the potential of technological advancements to create an engaging and effective language-learning process. This approach not only produces high-quality results but also instills a sense of validity and importance that extends beyond the confines of the classroom. Task-based language teaching has garnered significant attention from academicians in language education and second language acquisition from the 1980s. Current literature on task-based language teaching highlights its theoretical concepts and real-world application in foreign and second language teaching, which is continually growing. The integration of learning technology into task-based language teaching has the potential to instill confidence and motivation in learners and open a path for them to use their second language skills effectively in real-world situations, which is crucial in the twenty-first century. This analysis aims to examine the relationship between technology and task-based language teaching. It explores how technology affects task-based language teaching and vice versa, while also addressing the difficulties that arise when using task-based language teaching in technology-based contexts. Furthermore, this review illustrates a range of crucial aspects that require attention to further the development of technology-enhanced task-based language teaching.

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Keywords: computer-assisted language; learning digital literacies; second language acquisition; task-based language teaching; technology-mediated tasks

1. Introduction

The advancement of technology has resulted in the widespread adoption of online learning and technologies that facilitate language learning. This development has had a positive impact on language pedagogical approaches, including computer-assisted language learning (CALL), mobile-assisted language learning (MALL) and virtual courses through learning management systems (LMS). These systems have proven to be powerful, as they offer flexibility, accessibility and dynamism in transferring materials, instructional processes and learning assessments to diverse language learners (Anwar & Arifani, 2016). The integration of technology into language instruction enables learners to autonomously enhance their learning engagements and maximize opportunities for learning (Kiliçkaya & Latoch-Zielinska, 2014; Mulyono, 2016; Tananuraksakul, 2016). By leveraging technology, learners can develop their language skills with greater ease and efficiency, leading to improved outcomes and increased confidence in their linguistic abilities. These findings highlight the importance of embracing technology in language instruction to provide learners with the tools they need to succeed in an increasingly globalized world.

Over recent decades, TBLT has attracted the interest of researchers specializing in second language acquisition (SLA), program designers and academicians around the globe. TBLT is a learner-centered and experiential approach to language teaching and learning. It is based on the premise that language learners can enhance their SLA through engagement in communicative tasks that compel them to use language for themselves. TBLT stands in contrast to more traditional approaches and its use is being advocated in many contexts across the globe. It is officially endorsed in several countries and has been the subject of investigation and debate for decades. Long (1985) and Prabhu (1987) introduced a method for language learners, providing practical and effective tasks that focus on communication and language usage in real situations for non-linguistic purposes. It is worth noting, however, that a considerable number of the studies on TBLT have been controlled in language laboratory settings or under strictly supervised circumstances. Furthermore, the majority of research findings disclose the psycho-linguistic features of the method and aim to enhance comprehension of how students learn a second language (L2). Ellis (2022) found the core idea behind TBLT is that 'communicative activities' act as the curriculum's fundamental building blocks and are the only place in the educational cycle in which meaning is prioritized. "Centering language education around tasks is expected to give learners an experiential educative process in which they use the target language for meaning-making and in which the language use process will spur and promote the learners' language acquisition" (Samuda & Bygate, 2008, p. 69). Yet, developing strategies to make communicative tasks more reliable or viewed as reliable by the students when they are used in classroom settings is the first

challenge while creating tasks that encourage communication with meaning is a second challenge.

Tasks have been widely used in SLA research as a means of inducing language output, engagement, meaning negotiation, input processing and concentration on form which supports second language learning. Tasks used as the fundamental organizing units for educational activities in traditional language classrooms have received less empirical study than other organizational methods. Due to the expansion of information and technology in this prevailing age, TBLT and learning ought to focus primarily on technological developments. The requirements of the students, who live in the digital age, are driving the need for integrating technology and TBLT. Therefore, designing learning materials, particularly for English teachers and curriculum designers, should meet contemporary demands.

This study focuses on the connections between chosen tasks and technology. It begins by exploring the theoretical foundations of TBLT and refining the definitions of both tasks and TBLT. The study then examines the interplay between technology and TBLT which serves as a valuable educational framework, establishing principles that optimize technology for language learning. Furthermore, technology empowers and enhances TBLT, contributing to its effectiveness. Lastly, the study addresses the challenges associated with implementing TBLT in technologically advanced settings. The discussion of issues for future study and practice serves as our conclusion.

2. Task-Based Language Teaching Theories in Detail

In opposition to more conventional synthetic approaches, which require learners to acquire decontextualized language elements before applying them correctly in useful real-world contexts, the primary focus in the TBLT method is on communication, connotation and how language learners can use it. “TBLT owes its genealogy to the educational theories that highlight the interrelationships between experience and learning and is rooted in cognitive and interactionist SLA theory” (Doughty & Long, 2003, p. 58). According to Long (2003), “TBLT is an embryonic theory of language teaching that incorporates various efficient teaching components derived from SLA theories and works in education and psychology” (p. 51). “Bruner's notion of learning for use through participation in a group and insistence on the progress of innate understanding through engaging with real-world problems“ (Samuda & Bygate, 2008, p. 69) is where TBLT has its foundation.

SLA is one main branch of applied linguistics that deviates from the interaction approach and acts as a theoretical base for TBLT. Long (1996) argues that “It stresses that engaging learners in communicative activities provides them [i.e., students] with quality language input and negative feedback, pushes them toward modified output and channels their attentional resources selectively on structural properties during the interaction” (p. 418). This particular theoretical tenet asserts that TBLT provides an opportune linguistic environment for second language learning as exchanged communication is advantageous to the learners.

On the other hand, the sociocultural approach to SLA also lends support to TBLT. This approach argues that language learning is achieved through learners' interaction with various social-material environments, encompassing physical, social and symbolic artifacts (Lantolf & Thorne, 2006).

The significance of TBLT in providing opportunities for collaborative dialogue and scaffolding is the foundation of learning and is, thus, supported by this theoretical viewpoint. Another theoretical base for TBLT is the ecological theory of language learning. "An ecological approach to language learning views language learning as a relational human activity co-constructed between humans and their environment" (Kramsch & Steffensen, 2008, p. 18). Atkinson (2002) articulates that the purpose of language acquisition is "To act, and by acting, in a world where language is performative" (p. 527), underscoring the idea that language learning is not just about acquiring knowledge but is fundamentally tied to engaging in meaningful actions within the linguistic environment. Through completing genuine tasks, TBLT offers and facilitates situations for acting and accomplishing objectives.

Theoretical frameworks underpin the design and implementation of instructional practices for technology and task-based language learning (TBLL). These frameworks provide a systematic approach to designing and implementing instructional practices that enhance learning outcomes for students, informed by theories such as constructivism, connectivism and sociocultural perspectives in technology and cognitive psychology, interactionist perspectives and sociocultural theory in TBLL. Their purpose is to enhance learning experiences, promote collaboration and facilitate knowledge construction. They assist educators in making informed decisions about selecting, integrating and evaluating technology tools and resources within instructional settings. Adherence to these frameworks enables educators to create an environment that supports the learning process, promotes knowledge construction and fosters collaboration.

3. Tasks in technology-enhanced TBLT

It is important to gather comprehensive information about the technological tools that are integral to TBLT's participants' skills. According to Samuda and Bygate (2008), it is imperative to consider the digital literacies, accessibility, resources and support available to the learners while designing the TBLT curriculum. Additionally, the population of students must be taken into account as their ability to access technology and digital literacies might fluctuate significantly, potentially influencing the curriculum design. Consequently, a thorough evaluation of these factors is critical for designing an effective TBLT program that caters for the diverse needs of the student population.

In a similar TBLT review, Ellis (2009) presents the following operational definition that encompasses the holistic use of language to achieve both linguistic and non-linguistic goals, thereby facilitating the establishment of a central focus:

> *[TBLT] aims to develop learners' communicative competence by engaging them in meaning-focused communication through the performance of*

> *tasks and its key principle is that learners' primary focus should be on constructing and comprehending messages, while also paying close attention to the form of the language for effective learning to occur* (p. 223).

The statement posits that students are expected to undertake tasks autonomously, with minimal intervention from the teacher and that language acquisition should ensue as an almost natural outcome. It is of paramount importance, in the context of this study, to conceptualize the term 'tasks' in light of the diverse definitions that have been proposed. Additionally, the significance of 'task performance' in the digital environments is highlighted.

For this review, it is crucial to establish a clear and precise definition of the term 'task' and the implementation of technology into teaching methods to ensure accuracy. "A task is a holistic activity which engages language use to achieve some non-linguistic outcome while meeting a linguistic challenge, with the overall aim of promoting language learning, through process or product or both" (Samuda & Bygate, 2008, p. 69).

For successful language learning, it is crucial to focus on understanding the meaning and context of sentences instead of just memorizing individual words. Communication should have a clear purpose, whether it is sharing information, expressing opinions or deducing meaning. Students should rely on both their language skills and other ways of expressing themselves to complete their tasks effectively. Furthermore, language should act as a medium to achieve the defined result, rather than being an end in itself.

The field of language learning has two dominant definitions of tasks. The first definition places importance on the features of a language, while the other definition emphasises the completion of controlled and structured activities by individuals or groups. The appropriateness of giving primary attention solely to the linguistic aspect is debatable when incorporating TBLT into the virtual environment. To understand the potential effects, the tasks used in virtual settings differ from those in traditional language learning. Technology has enabled more diverse and creative ways to implement TBLT, emphasizing tasks that prioritize communication and interaction. Hence, a change in focus is required to ensure that learners acquire the skills needed for effective communication in a technological context.

Incorporating technology in learning environments offers more resources and avenues for task performance. It also allows for a more flexible and less structured approach to tasks. Lamy (2007) defined technology-enhanced tasks as "Less structured, inquiry-based task spaces" which foster learner agency and identity enactment (p. 263). Ortega (2009) advocates for the affinity between technology and TBLT and stresses the importance of broadening our conceptualization of 'tasks' to encompass projects and quests. This view allows us to understand the potential benefits that technology can bring to TBLT.

Based on these arguments, researchers have suggested that the tasks can be seen as complex activities where students use their language, social, and communication skills to achieve goals beyond just language. This involves improving their language, cultural understanding, online communication and digital literacy abilities. While the traditional definitions of tasks in language learning have been useful, they may not be entirely appropriate for technology-mediated contexts. In such a context, it is necessary to consider alternative task definitions that are better suited to the current technological landscape.

4. The relationship between technology and TBLT

This part examines how technology and TBLT are mutually beneficial. Researchers offer study findings on TBLT's contributions to technology-enhanced language learning as well as TBLT's contribution as a pedagogical framework.

4.1. *Can technology be used to improve learning outcomes from tasks?*

A substantial body of research has scrutinized the viability and, more importantly, the potential value of utilizing technological means to complete tasks. Studies have explored the efficacy of online tasks in fostering language acquisition. These tasks comprise both individual communication tasks and systemic TBLT cycles. The online tasks have been examined in the context of both text-based and multimodal computer-mediated communication (CMC) tasks. These tasks may take the form of synchronous communication, such as online chatting or asynchronous communication, such as email, blogs and wikis. It has been demonstrated by research that technology, particularly text-based CMC, can enhance both the content and meaning of language production during task performance among students. Text-based CMC provides a platform for anonymous contributions, which can effectively lower affective filters and motivate students to use language to a greater extent. Studies have indicated that students produce more language, including turns, words and sentences, during task performance in text-based CMC than in face-to-face interactions. Diverse methods of CMC have varying impacts on induced language. Synchronous CMC, where interaction occurs in real-time, has been found to induce more language production in online interaction as well as in one-on-one discussions than asynchronous CMC.

In evaluating the research, it was found that multimodal computer-mediated communication (MCMC) has the potential to enhance language production during task performance. This enhanced language production is due to the combination of audio, video and text, which allows for a more comprehensive communication experience. Text-based CMC is a highly effective means of facilitating communication and learning. By combining the strengths of spoken and written discourse, CMC enables students to improve their grammar and sentence structure through more complex tasks and interactions. This makes it a valuable tool for educators seeking to enhance student performance and promote constructive learning outcomes. Studies have shown that online audio chats encourage learners to use their second language more and engage in fewer off-topic conversations compared to in-person interactions. Furthermore, collaborative project-based tasks in a wiki have been found to encourage greater

creativity in writing and more complex language production over time. Overall, learners produce a wider range of speech acts and discourse functions during task performance in both text chat and virtual worlds. This indicates that digital usage in learning can broaden the scope of language production and enhance the quality of language output.

Researchers have explored whether technology-mediated task performance leads to improved language development. They suggest that the expert scaffolding provided by team members at the time of task performance in a digital context can help students to self-regulate their learning; for example, the collaborative behaviors during digital gameplay facilitated second language learning for English as a second language (ESL) students and native English speakers. Chung et al. (2005) established comparable outcomes concerning the performance of online tasks among two different language speakers respectively a native Korean and an American. The Korean expert peer extended support by comprehending the meaning of questions and context, which facilitated the American partner's comprehension of the Korean language and culture. Thorne (2003) demonstrated in another study how task performance mediated by technology with a native speaker partner helped Kirsten, a French learner, to gain self-regulation over French. Kirsten gradually transitioned from object regulation, where she relied on sentence structure featuring conversation models to other regulations in the instant message and email interactions with her intercultural partner. Eventually, she progressed to self-regulation, where she engaged in an extended and unrehearsed dialogue in French. These findings indicate the potential of scaffolding and technology in facilitating language and culture learning.

Research studies have demonstrated that technology-mediated task performance has a positive impact on long-term language development. Researchers have found that such task performance enhances proficiency in several critical areas, including syntax, vocabulary, speaking, writing and intercultural competence. For instance, Stockwell and Harrington (2003) disclosed that “Participating in intercultural email discussions led to improvements in syntactic development and incidental vocabulary learning” (p. 341) while Murray and Hourigan (2008) reported that “Blogging helped learners develop their writing with greater grammatical accuracy” (p. 83). Payne and Whitney (2002) similarly found that “Students who undertook a portion of their tasks via SMS and an alternative portion through face-to-face interaction outperformed peers who relied solely on face-to-face communication in speaking tests” (p. 11). From research findings, “The utilization of blogs for cross-cultural, project-based task performance can significantly enhance the development of intercultural competence” (Ducate & Lomicka, 2008, p. 17). Hence, the empirical evidence suggests that task performance in technology-mediated environments can be instrumental in fostering language development. The study highlights the benefits of leveraging technology to enhance language acquisition, particularly through the integration of cross-cultural projects. The findings suggest that blogs and other technology-mediated platforms can provide fertile ground for developing intercultural competence, which is essential in today's increasingly globalized business environment.

4.2. How can technology improve learning outcomes from tasks?

With the increasing emphasis on technological competence to enhance TBLL and performance, researchers have aimed to understand the role of technology in the broader context of task-based language development. Several factors have been identified in this regard, such as fostering equitable participation, improving one's ability to observe and self-monitor, and facilitating role play and interaction. The mentioned features are all instrumental in the development of learning a language.

Inquiry into how technology may optimize the production of learners during task performance has led researchers to enhance and equalize participation. Specifically:

> "*The features of online discourse and analyses of learners' behaviors during online interaction have shown that text-based CMC equalizes participation during task performance through the reduction of static and dynamic social context cues and the absence of oral interaction constraints, such as interruption, transfer of speakership and extra attention freed-up from monitoring pronunciation.*" (Sullivan & Pratt, 1996, p. 498)

Consequently, students have demonstrated more balanced participation during task performance via text-based chatting. The convergence of several factors operates synergistically to promote the equitable production of language among learners during task execution, facilitated through CMC that relies on text as its medium.

"Multimodal communicative environments afford learners greater control over their learning process, thereby supporting learner agency in the learning process by allowing them to engage with various communication modes and tools to actively participate in task performance" (Kenning, 2010, p. 7). Empirical evidence suggests that text chat is widely used in multimodal conferencing systems to achieve different communicative goals, such as signaling or circumventing sound problems, clarifying queries without intruding on the stream of the message, legitimizing oneself like a turn-taker (Beauvois, 1998; Chun, 1994; Kern, 1995) and even engaging in general conversation (Lamy, 2009). A study conducted by Sauro (2004) revealed that "The use of text chat serves as a tactical tool that aids in sustaining a foothold in the conversation and facilitates the task performance of less dominant speakers" (p. 63). In sum, multimodal communicative environments provide a platform for the students to engage in numerous communicative tasks and methods, which suit students' needs, thereby bolstering their participation and engagement in task performance. The use of text chat is a critical component of these environments, as it allows learners to communicate more effectively and strategically, resulting in more productive and meaningful interactions.

Researchers have investigated the influence of online task performance on second-language learners' cognitive and linguistic capabilities, as well as their

motivation. Research results suggest that engaging learners in communication through technology helps cultivate positive second-language characteristics. This, in turn, indirectly supports their language learning by encouraging active involvement. Studies showed how online communities have helped English learners gain confidence and improve their language skills. Learners found a new identity as successful English speakers when communicating with peers on the internet (Lam, 2004) This research highlights the importance of online platforms for language development and socialization. Educators and practitioners should recognize their potential to improve learning outcomes. Correspondingly, a study by Black (2006) found that learners leveraged the various elements of an online platform to improve their writing skills and engage with other members of the community. They used the social aspects of the platform to connect with other writers, share feedback and receive guidance. Additionally, they made use of the textual elements of the website to read and engage with various literary works, thereby expanding their vocabulary and enhancing their understanding of the target language. It helped them to leverage the technological aspects of the platform to develop their digital literacy skills and engage with modern technologies. In conclusion, learners who establish a positive L2 identity are more motivated to invest their time and effort in language learning. This research underscores the potential of technology-mediated communication environments for enhancing learners' linguistic and cognitive skills, as well as their motivation, and highlights the importance of cultivating a positive L2 identity in language learning.

4.3. Can technology enhance our understanding of TBLT?

In the preceding section, a comprehensive analysis of research studies was conducted to demonstrate the ways in which technology can bolster TBLL. Still, the implementation of technology in TBLL extends beyond, as it contributes to the enrichment of TBLT, by urging researchers to reconsider how tasks are set out. Researchers are currently reviewing the features of tasks in technology-mediated environments and redefining appropriate tasks accordingly. The performance of tasks in these environments, particularly in electronically mediated task performance, is not limited to language performance alone. It also comprises multifaceted skills such as digital literacy, communicative competency and intercultural understanding. According to Lamy (2004), successful technology-enhanced TBLT necessitates a blend of communicative skills, which include linguistic-functional, sociocultural, institutional and environmental competencies. In technology-mediated surroundings, sociocultural and institutional competencies manifest in distinct ways, entailing comprehension of social and cultural norms and the aptitude to engage in mutual discourse.

Researchers have highlighted the critical importance of comprehending task performance by understanding the various tasks that are given during online platforms. It happens because individuals are inclined toward specific types of play when communicating online, and this can have a significant impact on their ability to perform tasks effectively (Warner, 2004). Lam (2000) argues that it is necessary to develop “a communication model that can explain the process of in what way students' individualities are shaped via a formal role play, dramatic acts

are necessary to comprehend this phenomenon" (p. 477). This is particularly relevant in the context of L2 literacy development in the digital networked context, where students must know how to use massive online communication tools. Furthermore, the implementation of TBLT in technology-mediated settings has encouraged academicians and researchers to investigate an extensive set of constructs beyond the outdated concepts connected with TBLT, such as conversation exchange. Researchers are now exploring the role of different types of play, as well as the development of learner identity and other related constructs, to gain a better understanding of how TBLT can be effectively implemented in technology-mediated environments. Overall, these results emphasize the role of learner identity in the context of technology-mediated environments. By developing a deeper understanding of these constructs, researchers and educators can better design and implement teaching and learning strategies that can maximize learning outcomes. The integration of technology into language learning has prompted researchers and practitioners to explore effective pedagogical cycles that cater to this novel environment. Two primary propositions have emerged:

(a) the pedagogical-tasks-to-target-task cycle (Long, 1985) and
(b) the pre-task, during-task and post-task pedagogical cycle (Ellis, 2003; Willis, 1996).

The major variance between these approaches is their stance on form: "The extent to which, and the timing of, form-focused language instruction" (Ellis, 2009, p. 223). In technology-mediated environments, the pertinent question is: What does a suitable TBLT pedagogical cycle encompass? In addition, what do instructors emphasis within the pedagogical cycle? In studying intercultural and intracultural CMC, the literature recommends an extended pre-, during- and post-task TBLT pedagogical cycle that caters to digital settings. It highlights the importance of students intentionally preparing for digital activities in the pre-task stage.

This preparation includes explaining to students the main idea and providing closely connected conversation exchange models (Abrams, 2006), "to help them comprehend each other's cultural norms and practices, communication routines, sociocultural perceptions, and practices for the specific skill used for communication" (Thorne, 2006, p. 8). Furthermore, it is essential to furnish students with clearly defined assessment criteria and performance expectations during task execution, as advocated by Ware and O'Dowd (2008). This will enable students to execute the task with proficiency. The significance of the post-task stage in language learning has been well-established in scholarly literature (Skehan, 2003). Teachers are advised to carefully plan post-task activities that are aligned with previous learning (Ware & O'Dowd, 2008). These activities may encompass an examination of the learner-generated corpus derived from their prior performance in the activities (Belz, 2006; Belz & Vyatkina, 2005), or a reflection on performance through an analysis of the recordings of audio interactions and the shared screen content (Levy & Kennedy, 2004). These activities can be instrumental in consolidating learning outcomes and promoting effective language acquisition.

In the opinion of the researchers, the implementation of TBLT in technology-mediated environments requires careful consideration of the additional understanding and the increased value of task performance. Consequently, it is highly recommended that a TBLT pedagogical cycle is adopted with a greater emphasis on pre- and post-task stages. This approach can significantly facilitate and enhance the learning process, enabling learners to better comprehend and elaborate on the knowledge obtained from the task. Thus, it is crucial to recognize the importance of incorporating these stages in TBLT to achieve optimal learning outcomes.

5. Role of technology-mediated TBLT in language learning

In this section, the analysis encompasses a comprehensive review of the literature examining how TBLT can act as an effective academic approach to boost TBLL. Chapelle's (1997) pivotal work on how technology enhances language learning concluded that incorporating educational principles was fundamental to theory-guided and ethical approaches to strategy that could leverage technology's capabilities to optimize language acquisition. Added to Chapelle's work, Doughty and Long (2003) introduced the concept of TBLT to elevate the quality of technology-supported language learning. They presented 10 TBLT methodological principles with practical examples of their application to create impactful technology-enhanced language learning settings. In recent times, there has been a surge in research endeavors aimed at examining the integration of the TBLT pedagogical framework within the context of TBLL. Notably, Smith (2009) and González-Lloret (2008) undertook separate research studies to investigate technology-enhanced TBLL, focusing on its use as a formal project and an optional activity.

The studies provided valuable evidence that students who engage in dynamic interactions with their interlocutors tend to incorporate their feedback, leading to a lasting positive impact on their ensuing use of L2, regardless of their age. Furthermore, exploratory studies have recognized the viability of using the TBLT framework for designing online courses, which can significantly enhance the learning experience of beginners. The publications by Hampel and Hauck (2004) and Hampel (2006) offer highly motivating perspectives, underscoring the positive perceptions held by both students and educators regarding online tutorials adopting the TBLT approach. Despite the limited number of quasi-experimental studies conducted, they have demonstrated the effectiveness of online TBLT courses. In similar research by Lai et al. (2012), the outcomes of online TBLT and in-class teaching methodology were compared. The research revealed that implementing the TBLT approach resulted in improved fluency among students in the end-of-semester language assessments. In addition, students conveyed their overall satisfaction with the TBLT method.

Appel and Gilabert (2006) conducted a two-month study to evaluate the language construction of email tandem pairs who were allotted tasks with those who were not. The findings indicated that the allotted tasks resulted in significantly high volumes of language production that were more consistent in terms of the repetition of exchanges with partners and interest in supporting conversation.

This study postulates that TBLT represents a viable pedagogical framework that can effectively design and bolster the efficacy of TBLL.

6. Difficulties and demands of instigating TBLT via technology

The link between technology and TBLT is evident but the use of technology also introduces new complexities for both learners and teachers. Language learners must be proficient in computer skills when using technology for language learning, while teachers must adapt their pedagogical approaches to guide instruction effectively in a technological context. Researchers studying TBLT must redefine key concepts and research methods to determine the impact of technology on task design and execution.

6.1. Expectations from the learners

The effective integration of TBLT in a digital environment, particularly in telecollaborative projects, requires students to develop proficient project management skills. This includes:

> "*Digital literacy, communicative competency and intercultural competency. However, they are frequently noted to be lacking in these skills, either through their unawareness of the affordances of different media or through their incapacity to use them constructively to meet their learning needs.*" (Reinders & White, 2010, p. 62)

Apart from the lack of digital literacy and technology skills, students do not have enough social skills or the inclination to obtain skills, which is crucial to the success of telecollaborative projects, as reported by O'Dowd (2003). Thus, there is a need for learners to acquire these skills to ensure successful telecollaborative projects, particularly in technology-enhanced environments.

The effective integration of TBLT within technology-mediated settings hinges not only on the proficiency and comprehension of the learners, but also on the impact of their background and social setting to perform their online tasks. Kramsch and Thorne's (2002) study showed that different sociocultural norms influenced how American and French students used CMC tools, resulting in communication breakdowns and unfulfilled expectations in telecollaborative endeavors. To succeed in technology-mediated environments, learners must be mindful of their own and their partner's behavior. The success of TBLT implementation greatly depends on the learners' proficiency in the required knowledge and skills. Consequently, it is imperative to prepare them adequately. Current research investigations have substantiated the efficacy of learner training in bolstering TBLT results. While the literature provides recommendations on the areas where learners require training, there is still a need for contextualized training models for diverse backgrounds and precise training guidelines that can direct everyday operations.

6.2. Expectations from the teachers

The integration of TBLT within technology-enhanced learning settings poses a complex challenge for educators. The prerequisite to handle the technology and novice students creates a high level of complexity that imposes many demands on

teachers. To facilitate good learning outcomes, teachers must play various roles. These roles include raising learner awareness, designing appropriate tasks, monitoring collaborations and supporting them in refining their knowledge which contributes to active communications in online and offline settings. Besides fulfilling their duties during task performance, teachers are instructed to undertake significant responsibilities both prior to and following the task. Pre-task, teachers must impart suitable training and conduct activities regarding intercultural communication, emphasizing technical details. The training should cover how to elicit cultural meanings from partners and create clear outputs that express comments to speakers in a conversational exchange. Upon completion of a task, teachers play a crucial role in helping students by reviewing their interactions, examining the transcripts and discussing the language and intercultural issues that appear. This is an important aspect of technology-enhanced TBLT: it requires a pedagogical shift, where teachers move away from being an 'omniscient informant' and instead focus on organizing, understanding and interpreting the intercultural experiences of their students. This constructive approach enables teachers to support learners in developing their social competence and empowers them to partake actively in future interactions.

Teaching language through tasks in technology-based settings presents a notable challenge in enhancing teachers' understanding of pedagogical principles related to the tools used in such settings, along with their interpersonal and intrapersonal skills. The objective of such enhancement is to enable teachers to assist as active mentors and instructors to their students. Research done by Fuchs (2009) examined the efficiency of a contextualized approach that linked ESL student-teachers in the US and English as a foreign language (EFL) student-teachers in Germany through Computer-Mediated Communication and encouraged them to collaborate in developing TBLT components. However, the lack of research in this domain hinders the ability to proficiently address problems embedded in educational settings where technology and TBLT meet. Therefore, further research is warranted to gain a comprehensive understanding of methods to best train teachers to use technology effectively in a TBLT approach.

6.3. Expectations from the researchers

Implementing technology-enhanced TBLT presents challenges in research due to the differences between TBLT and traditional language teaching methods. Traditional research models are not suitable for evaluating online task performance, making it difficult to operationalize technology-enhanced TBLT. However, integrating technology into TBLT proves effective in developing skills beyond mere language acquisition, including collaboration, communication, digital literacy and identity formation (Warschauer, 2001, p. 53). Thus, research is needed to determine the value of these outcomes.

This requires assessing students' ability to team up with and communicate successfully with native language speakers via online platforms to develop intercultural competency, digital literacy skills and foster their language identity. While many studies have attempted to investigate the related topics, it remains challenging to capture this complexity. Proposals such as interventions for

beginners, interpersonal and intrapersonal social competency, as well as digital literacy, which are integral to technology-enhanced TBLT, are difficult to evaluate and measure. The efficacy of the conventional analytical framework for online interaction in technology-enhanced TBLT has been the subject of scrutiny by researchers. To this end, it has been proposed that a review of the nature of learning through technology is imperative. For instance, the lack of turn adjacency in text-based CMC warrants an accommodating model for negotiated interaction. In 2008, Smith proposed an expanded negotiated interaction model, which accounts for fragmented negotiation routines, that is, the interruption between the starting point or stimulus that initiates communication and the response. Based on Smith's research, it is necessary to revise the conventional approach to an extended or adaptable model in TBLT.

Scholars in CALL face various difficulties when it comes to gathering and analyzing research data. Smith (2008) contends that relying solely on printed transcripts for the analysis of online synchronous interaction data is inadequate, as they do not capture critical information, such as deleted or relocated text in text-based chat conversations. These indicators play a crucial role in monitoring learners' language development, making it clear that relying on simplistic data collection methods could be detrimental to research outcomes. Seedhouse and Almutairi's (2009) research highlights the significance of comprehending the intricate nature of task-based interactions that involve multiple modes of communication. They underscore the limitations of relying exclusively on chat transcripts to understand such interactions. To overcome these limitations, they proposed a comprehensive approach that integrates nonverbal communication, physical performance and the nuances of a conversation. This approach offers a more in-depth and nuanced understanding of task-based interactions, fostering more productive communication and collaboration. Technology provides practical solutions, such as screen recording software, video recording, and eye-tracking systems to capture learners' gestures, facial expressions and eye-gaze respectively (Smith, 2010; Seedhouse & Almutairi, 2009). Gathering accurate and substantial data regarding synchronous online interactions plays a crucial role in assessing cognitive constructs like text observation and concentration during online task execution. Nonetheless, gathering and deciphering this data can be a demanding task. Conventional approaches to analyzing chat transcripts and interaction records may fall short when it comes to comprehending learners' online interactions. In this regard, Lamy (2007) has recommended "A combination of conversation analysis, social semiotics, and semiotics to provide a more detailed analysis of online interaction and learner agency" (p. 254). Despite the benefits of this approach, it requires a considerable time investment and may be labor-intensive, given the complexity of technology-enhanced task performance. Furthermore, researchers encounter the challenge of determining the most effective approach to comprehending the extensive information related to the complexities of learner behavior before and after online task performance.

7. Implications

Due to the intricacies involved in operating new technologies during the learning process, learners often find themselves perplexed when faced with unclear

instructions and insufficient support from their teachers. S/FL teachers are encouraged to leverage the advantages offered by technology-mediated tasks to cultivate a student-centered learning environment. On the other hand, it is essential for educators to offer students instruction and guidance during the various stages of task completion, namely the pre-task, during-task and post-task phases. S/FL teachers who are keen on incorporating technology-mediated tasks into their instructional practices should actively expand their technological knowledge and develop the necessary skills to use technology effectively in their classrooms. It is crucial to recognize that the findings produced in the current investigation may not be all-inclusive, despite being subjected to meticulous examination. It is conceded that the findings of this investigation focus mainly on technology-facilitated task-oriented language instruction research carried out in ESL and EFL settings, and may not adequately represent the perspectives of learners and instructors in alternative educational environments. Nonetheless, the emergent themes identified in the current research can serve as a guide for future TBLT and CALL studies, and the potential synergies between them.

8. Conclusion

In an evolving area of research, such as the integration of technology in TBLT, the research agenda is open-ended. For instance, we need to explore the potential of smart spaces equipped with sensory devices that can comprehend participants' movements. Furthermore, we should investigate how language-learning theory and methodology can be revised to integrate the more transparent tools that now facilitate communication and learning processes. There are unresolved issues in task research, like task complexity, cognitive capacity, accuracy and fluency. These issues also have relevance in technology-mediated TBLT, where technological aspects add layers of complexity. In a technological context, the cognitive factors that influence task complexity have not been thoroughly investigated. Furthermore, other factors, such as task condition and task difficulty, remain unexplored in technology-mediated tasks compared to face-to-face tasks. Thus, it is essential to conduct further research on task complexity that takes into account these factors. Another crucial area of exploration is the study of multimodality and its function in technology-enhanced TBLT with the increased accessibility of broadband connectivity, multimedia platforms and mobile devices. Lastly, the teacher's role is crucial for the success of technology-mediated tasks. Even if we have a well-developed and engaging technology-mediated TBLT curriculum, its effectiveness will be compromised if teachers are unwilling or unprepared to implement it (González-Lloret, 2014). Hence, further research is required to comprehend the function of educators and teacher training in technology-facilitated assignments.

In summary, research at the intersection of technology and TBLT is in its nascent stage, presenting a multitude of fields and topics that are ripe for investigation. These range from theoretical and foundational issues concerning the nature of tasks, their sequencing, implementation and evaluation when mediated by technology, to the rapidly evolving world of innovations and their potential to incorporate effective language-learning tasks.

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