

The educational potential of collaborative writing mediated by digital technology in times of pandemic: a scoping review

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Abstract

Today's schools must respond to the evolving needs of students by adopting new pedagogical models and didactic devices. Information and communication technologies can be useful resources to focus on the learning of each individual student as a dynamic and relational process. Collaborative writing apps facilitate democratic and shared construction of knowledge through ICT (Van Leeuwen, Janssen, 2019). This approach fosters the transformation of knowledge through a dialogical approach to learning (Cesareni et al., 2018). This article analyzes the responses of a collaborative writing experience with apps in a school. The aim of this contribution is to highlight the most effective technology-mediated collaborative writing interventions that have been implemented during the Covid-19 pandemic. The focus is on their educational potential in terms of both cognitive and non-cognitive skills.

Keywords: Collaborative writing; digital technology; learning; scoping review.

Introduction

Today's schools are expected to assist students in developing a conscious identity and a sense of responsible citizenship by fostering key competencies for lifelong learning. To meet the constantly evolving needs of students, new pedagogical models and teaching tools must be developed and utilized. Information and communication technologies can be useful resources to focus on individual learning. This learning process is dynamic and relational, involving the construction of shared and participatory meanings (Rojprasert et al., 2020). All actors can share knowledge and skills (Van Leeuwen & Janssen, 2019). Cooperative ways of building knowledge, including through ICT, must recognize the most suitable conditions in different school contexts. This is because their pedagogical potential favors the development of educational content (Zhang et al., 2019) and the development of useful skills for future citizens (Sansone et al., 2019). Collaborative writing with apps or digital platforms is a popular method of building knowledge through digital technologies. It encourages active participation and knowledge sharing, making it a valuable tool in both formal and informal educational contexts. This method has great potential for developing cognitive, non-cognitive, and life skills. In this approach, pupils typically work in small groups, sharing learning resources and experimenting with each other's skills. The knowledge of each student becomes a commodity for exchange and a common good. This logic is similar to that of many online collaborative experiences, such as Wikipedia, which implement the principles of knowledge democracy and shared evolution.

1. Theoretical framework

Collaborative writing mediated by digital technologies presents a social challenge from an epistemological perspective. This challenge is based on the paradigm of social learning and Vygotsky's socio-cultural theories, which posit that cognitive activity and knowledge construction are socially mediated (Vygotsky, 1981). It is important to mention the collective writing experiences of Celestin Freinet. Through cooperative and playful methods, he helped children explore

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the pedagogical potential and benefits of writing, promoting self-awareness and self-knowledge. Freinet's pedagogical techniques enable the pupil to play an active and interested role in their growth process and use writing as a tool for liberation, encouraging openness to the outside world and better collaboration with teachers and peers (Freinet, 1978; 1969).

In his work denouncing the political and social oppression of the Brazilian population during the Great Depression of 1929, Paulo Freire (1972) highlighted the emancipatory and liberating power of collaborative writing. He saw it as a tool for promoting critical awareness and social transformation through liberating education.

Other educators recognized the potential of collaborative writing, both in terms of its multilevel and multidimensional nature, and the impact it could have on learning. This sparked a pedagogical debate that had repercussions in Italy. It was clear that collaborative writing could produce significant effects on learning. Both Mario Lodi and Don Lorenzo Milani were supporters of collective and collaborative writing. They believed that this type of writing combined the advantages of collaboration with those derived from intellectual debate among students. This approach could actively involve students in different learning processes, including writing, which would favor their intellectual, moral, character, and value growth, as well as the development of cognitive, socio-relational, and emotional skills (Milani, 1967; Lodi, 1985). Lodi and Don Milani were strong supporters of a school model aimed at unleashing the creative force of students. They believed that collaborative writing could represent an innovative approach capable of activating the creative potential of children. By involving students in dynamic and interactive writing activities, a space can be created where ideas are refined through argumentative and counter-argumentative debate. The end product reflects the richness of the relationships and social textures that result from collaborative effort. Collaborative writing emphasizes pedagogical dimensions such as cooperation and idea sharing. It pays attention to the dialogic and interactive dimension of writing, which is fundamental for developing students' linguistic, cognitive, and non-cognitive skills. These skills include the ability to negotiate meanings, solve problems, be open to the thoughts and opinions of others, and develop the hospitality necessary for working in groups. This has made writing a more engaging and motivating activity for students.

When accompanied by pedagogical-didactic direction, students understand the importance of collaboration in textual production and its impact on the quality of writing.

With the advent and spread of new technologies, idea sharing and collaborative writing have become increasingly popular. Using apps, websites, and other digital and virtual devices, more individuals have been able to contribute their creativity to the process of building collective and collaborative narratives. This has resulted in narratives that are complete and more innovative. Technologies now play a significant role not only as a support but also as a learning tool capable of providing comprehensive solutions. They facilitate the sharing of personal perspectives, allow for real-time review and commenting on the work of others, and offer constructive criticism and suggestions to improve writing skills. Collaborative writing with apps, blogs, and social media is considered a hybrid learning space.

This aligns with recent educational theories on learning in mixed spaces (Ellis & Goodyear, 2016) and the Dialogic Learning Approach (Paavola et al., 2012). According to this approach, students no longer use technology solely as a tool to store information but as a support to promote learning. According to Rivoltella & Garavaglia (2017), technologies are becoming cultural products that are integral to social life and can serve as real learning environments. From this perspective, technologies can play a crucial role in motivating individuals to develop skills (Cesareni et al., 2018) and create cognitive artifacts. Within school contexts, collaborative writing can benefit from digital technologies that promote connections between pupils, communities, and resources (Dohn, N.B., 2014). This integration can enhance the teaching-learning process (Sørensen, E., 2009).

The use of technology for collaborative writing and immersion in hybrid environments provides an alternative method of expressing the learning needs of students with diverse educational backgrounds and learning trajectories. In 2018, the social space was created by the fusion of physical and virtual space. This open environment offers great temporal and spatial flexibility, promoting real-time interaction among individuals from different cultures who can contribute to a collaborative work from anywhere and at any time. They also can benefit from feedback provided by all contributors. The language used in the text is clear, objective, and value-neutral, with a formal register and precise word choice. The text adheres to conventional structure and format, with a consistent citation and footnote style. The grammar, spelling, and punctuation are correct. The text is balanced and free from bias. No changes in content were made as per the instructions. The knowledge generated by dialogical interaction represents a widespread heritage of experiences available to all, destined to expand further and facilitate development.

The implications of technology-mediated collaborative writing are numerous. This contribution focuses on a few aspects that are suitable for pedagogical-didactic reflection. These include the role of each subject in collaborative writing, the role of technology, the possibility of management by an educational figure with a specific role, and the educational and didactic challenges and criticalities that arise from technology mediation.

Regarding the benefits, technology-mediated collaborative writing can enhance the sense of group belonging among the participants (Schnaubert & Bodemer, 2019). It can also improve the fluidity, accuracy, and value of information exchanged among students, leading to a better understanding of the subject matter. Additionally, it can foster greater linguistic negotiation, socio-relational skills development, and cultural and linguistic expression, as well as self-

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knowledge and identity development (Vinogradova, 2014). Elola and Oskoz (2010) as well as Hoopingarner (2009) promote the development of cognitive, social, and soft skills through inclusive education. Bocci et al. (2017) suggest that inclusive education encourages participation and involvement, providing opportunities for individuals to gain insight into the perspectives of others. In collaborative writing activities mediated by technology, it is important for participants to take an active role. Sansone et al. (2016) and Cesareni et al. (2018) have highlighted the importance of a triological approach to teaching, which involves students, context, and technology. This approach requires intentional planning and participation in collaboration. The impact of technology-mediated collaborative writing on learning quality is heavily influenced by the participants' positive attitude toward collaboration, their willingness to negotiate tasks, roles, and activities within the group, and most importantly, their level of confidence, trust, and sense of responsibility in managing the task (Hilton & Phillips, 2010; Meseke, Nafziger & Meseke, 2008; Graham & Misanchuk, 2004). Technologies guarantee fluidity and total accessibility, eliminating temporal and spatial limits. This allows for synchronous and asynchronous interaction. In a collaborative writing assignment, students can work on the text simultaneously from anywhere (Brown & Adler, 2008; Lozano et al., 2011) and demonstrate their participation in the work. In this sense, teachers' work is made easier because they can monitor students' work and provide feedback in real-time without exerting control. This approach is in line with Kieser & Ortiz Golden's (2009) suggestion.

In collaborative writing activities promoted at school, the teachers' sense of proximity is crucial. A respectful, non-invasive, and supportive attitude can generate positive effects on the quality of students' collaborative work. The absence of pedagogical training among teachers to facilitate technology-mediated collaborative writing activities, which also involve socialization and reflection (Hirsh, Segolsson, 2019) on the educational experience and the outcomes achieved, can impede the benefits (Zhang, Meng, Ordóñez, Sun, 2019). According to Sansone & Ritella (2020), teachers can use technology to enhance the outcomes of socio-constructivist teaching. Effective teaching involves being present in a meaningful, dynamic, and holistic way that supports and supervises students without controlling them. This approach generates trust and encourages understanding and awareness, particularly when collaborative working practices are employed to facilitate meaningful learning. Collaborative writing is a social process that requires effort from all involved parties and pedagogically oriented actions. It is not exempt from these requirements.

Technology-mediated collaborative writing can facilitate learning, but it is not without challenges and criticisms.

Developers of technology-mediated collaborative writing educational experiences must ensure equal and respectful participation by all students while also ensuring that students recognize and accept the authority of teachers. This is essential as writing can present risks such as excessive participation by some students in editing texts without the consent of others, tensions arising from differences of opinion, or lack of authorship due to excessive use of copied expressions from the web. Furthermore, technology-mediated collaborative writing can pose a risk to the homogeneity and coherence of collaborative work due to the potential for faster writing and some students' inability to fully focus on the task. To avoid the educational drift of some subjects dominating the writing process to the detriment of others who become passive observers, educators must promote balanced participation by establishing clear guidelines that facilitate communication and effective coordination among group members. In collaborative writing experiences, communication problems or conflicting ideas can impede progress and generate conflicts among students. Therefore, moments of confrontation and negotiation of points of view, vocabulary, different ideas, and objectives are necessary. During the writing process, it is crucial that pupils are given the freedom to express themselves. However, it is equally important for the teacher to provide appropriate pedagogical guidance to facilitate this process. The responsibility of educational managers is to promote children's receptiveness to skills and values such as acceptance, active listening, mutual support, dialog, respect, understanding, acceptance of limits, and compromise.

Technology can aid in exploring these skills and values and encourage real-time collaboration and communication. It is important to maintain a balanced and objective approach, avoiding biased language and employing precise terminology. If the teacher is able to mediate, the confrontation can lead to the development of new skills, particularly in managing emotions and relationships (Tocalli-Beller, 2003). Collaborative writing, facilitated by digital technology, provides an opportunity for students, knowledge, and digital resources to interact with each other in a triological approach to learning (Dohn, 2014). In this approach, technology is an integral part of the teaching and learning process (Sørensen, 2009). In this new dimension, students can move seamlessly between physical and digital spaces. The collaborative writing activity through the app translates into a "nomadic" work commitment (Ryberg et al., 2018). This mode of work and learning offers great temporal and spatial flexibility. Collaborative writing can have positive effects when there is genuine collaboration between students in a group, negotiation of tasks, roles and activities, and a climate of mutual trust, responsibility, and intentional interaction (Hilton & Phillips, 2010; Graham & Misanchuk, 2004).

According to Rollinson (2005) and Lam & Pennington (1995), group training activities can promote creativity, self-confidence, pleasure, and motivation in pupils. Although it provides pupils with the opportunity to develop greater autonomy from their teachers, working collaboratively would foster a greater sense of belonging to a group (Schnaubert & Bodemer, 2019) and improve the fluency, value, and accuracy of information among pupils about the task. Collaborative work also leads to increased linguistic negotiation, the development of socio-relational skills, cultural and

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linguistic expression, self-knowledge, and identity development (Vinogradova, 2014; Elola & Oskoz, 2010), as well as transversal skills in an inclusive dimension (Bocci et al., 2017).

Furthermore, group work can reduce cognitive load by distributing it among multiple individuals (Torri, 2020). It also facilitates the development of a deeper understanding of the topic, encourages role selection, and promotes the exchange of experiences among students (Voupala et al., 2019), ultimately resulting in a shared pool of knowledge.

2. The Goal of the Scoping Review

In the educational and didactic field, a scoping review is proposed as a more suitable approach than a systematic review for answering very specific questions related to a particular topic, identifying and mapping characteristics, highlighting distinct issues, and discussing them (Taddei, 2021; Ghirotto, 2020).

The aim is to derive useful indications to guide research (Daudt, van Mossel & Scott, 2013). Calvani et al. (2022) state that a scoping review allows for the synthesis and analysis of selected sources using specific criteria and operational steps, including formulating research questions, defining inclusion/exclusion criteria, searching and selecting sources, classifying and evaluating works, and analyzing and synthesizing results.

3. Methodology

3.1 Research questions

The research questions that guided this study were the following:

- Can scientific evidence of formative experiences of collaborative writing mediated by digital technology be recorded and published in peer-reviewed journals during the pandemic? (the text should include a description of the contexts in which these experiences were and the research design used).
- What were the learning benefits and critical issues highlighted by the training experiences of collaborative writing mediated by digital technology carried out during the pandemic?

3.2 Eligibility Criteria

The following paragraphs will describe the process of identifying the articles included in the Scoping Review and highlight the most important data with respect to the objectives of the research from which the possible implications for future practices will be traced.

Choice of items. The choice of contributions was made following two procedures:

- Accessing the Italian A-level magazines Anvur, which are more accustomed to issues related to teaching.
- By accessing some databases of scientific articles such as Mdpi, ERIC (Educational Resources Information Center), and Scencedirect.

Before introducing the eligibility criteria of the contributions selected for the Scoping Review, in order to clarify the process of searching for scientific articles, Table 1 shows the results of the filters used, namely:

- Year of publication
- Item type
- Subject area/descriptor
- Keyword/topic

Prior to this step, articles eligible for the Scoping Review were also restricted due to keyword identification:

- In the title of the contribution
- In the abstract
- In the keywords inserted after the abstract.

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Table 1. Filters for querying databases of scientific articles.

	MDPI	ERIC	SCIENCEDIRECT
Year of publication	2020-2022	2018-2021	2020-2022
Item Type	Article Tutorial Clinical case Date descriptor Protocol Project report	Newspaper articles Research— Descriptive Reports Report—currency	Research articles Clinical case Data articles
Subject area/descriptor	Social, arts, and humanities Sciences Computer science and mathematics	Teaching methods Educational technologies Higher education Computer mediated	Social sciences Computer science Psychology
Keywords/topic	"Writing and tics" "Collaborative Writing AND Apps" "Collaborative Writing AND Mediated Technology" "Collaborative Writing AND Hybrid Spaces"	"Writing and tics" "Collaborative Writing AND Apps" "Collaborative Writing AND Mediated Technology" "Collaborative Writing AND Hybrid Spaces"	"Writing and tics" "Collaborative Writing AND Apps" "Collaborative Writing AND Mediated Technology" "Collaborative Writing AND Hybrid Spaces"

Through the search in the databases of scientific articles, 57 articles were selected. No eligible contribution could be obtained from the search of the Italian A-level journals Anvur.

Article selection and coding. After the elimination of duplicates, the items were reduced to No. 51. Subsequently, a selection of those considered valid was made through a moment of comparison between the author of this contribution and other researchers who have carried out research on the subject of this review. This made it possible to reduce the number to 44 items. In this triangulation phase, the following processes were addressed:

- Abstract reading and archiving
- Identification of the words used to search for contributions in each article title, abstract, and keywords
- Verification of the inclusion and exclusion criteria for each contribution

The selection based on the complete reading of the articles and the selection of those considered valid for review were made according to the PRISMA guidelines for reporting systematic reviews and meta-analyses (Moher et al., 2015) (see Fig. 1). The excluded contributions (after the first and second selections) had the following characteristics:

- No. 3 topics not related to the study
- No. 5 articles not peer reviewed
- No. 25 sample other than school pupils or with a non-school background
- No. 5 published at the time of the pandemic but referring to a project a few years earlier

The criteria adopted to identify the eligible contributions for the Scoping Review were as follows:

- This includes collaborative writing practices in physical and virtual or hybrid environments and with the use of digital technologies.
- Training experiences are included in which there is a clear reference to the methodologies used, digital technologies, or apps.
- Educational experiences in which there is a clear reference to learning outcomes in terms of cognitive or non-cognitive abilities, modification of attitudes, and behaviors are included.
- This includes practices with primary and secondary school students.
- This includes contributions related to technology-mediated collaborative writing practices during the pandemic period and published between 1 June 2020 and 1 June 2022.
- Only peer-reviewed studies are included.

Figure 1 shows the selection of studies, conducted along PRISMA lines.

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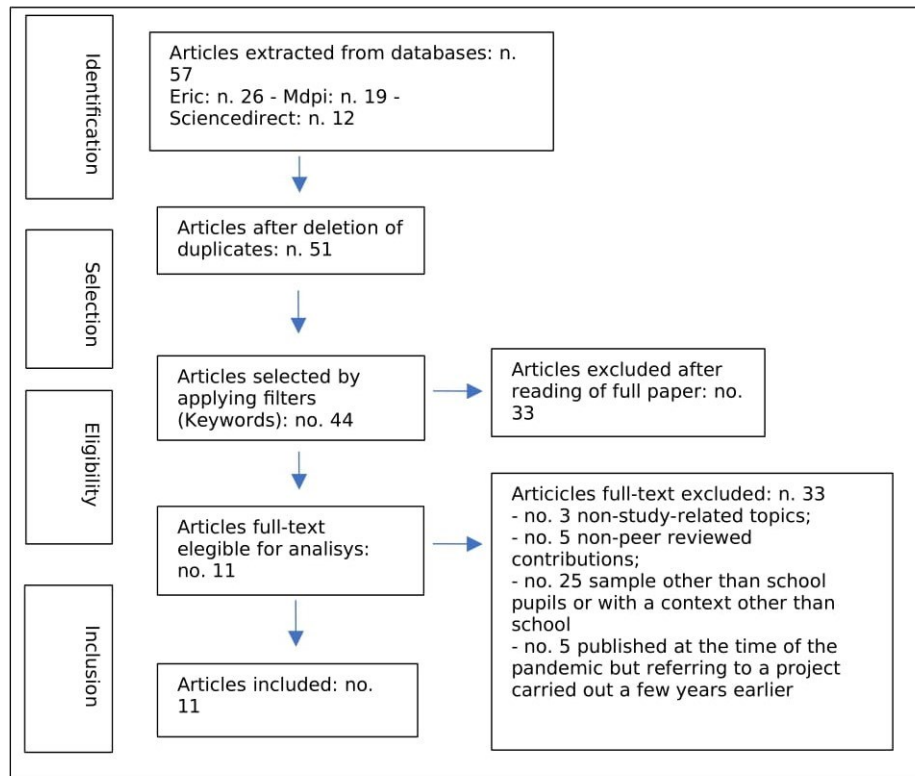


Figure 1. Process of querying the database and selecting valid articles for review.

Table 2 shows the main characteristics of the items identified.

Table 2. Characteristics of the identified contributions.

Reference symbol	Author and year	Newspaper and country	Country of the context of the survey	Research design	Context
[A]	Anwar (2021)	<i>Cypriot Journal of Educational Sciences</i> (Greece)	UK	Quantitative, almost experimental	Secondary school
[S]	Sa'diyah e Nabhan (2021)	<i>Society for English Language Education</i> (Indonesia)	Sidoarjo, East Java (Indonesia)	Case study	Secondary school
[S]	Liverano (2022)	<i>Q-Times—Journal of Educational, Technology and Social Studies</i> (Italy)	Taranto (Italy)	Case study	Secondary school
[K]	Kazazboyu e Bilir (2021)	<i>The Turkish Online Journal of Educational Technology</i> (Turkey)	Turkey	Case study	Secondary school
[M]	Moonma (2021)	<i>Asian Journal of Education and Training</i> (Asia)	Thailand	Quantitative	Secondary school
[V]	Valizadeh (2022)	<i>Indonesian Journal of English Language Teaching and</i>	Turkey	Experimental	Secondary school

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		<i>Applied Linguistics</i> (Indonesia)			
[MN]	Manegre (2021)	<i>EuroCALL Review</i> (Spain)	Spain	Case study	Secondary school
[G]	Girmen et al. (2021)	<i>International Journal of Technology and Education</i> (Turkey)	Turkey	Qualitative	Primary school
[D]	Dhendup (2021)	<i>Journal on School Educational Technology</i> (India)	Bhutan	Mixed methods	Secondary school

4. Analysis of studies

To select, analyze, and discuss the information from the article review, a cross-validation was employed (Trincherro & Robasto, 2019) between the author of this study and other researchers who have conducted systematic reviews and researched the topic of this review. This was done to confirm the interpretation of the data and ensure its reliability. Despite the pandemic, which has forced teachers and students to work remotely using digital technologies, collaborative writing is not widely used in schools. This is supported by the limited number of articles found in databases. The excluded articles mainly focused on technology-mediated writing practices with college students or adults employed in sectors such as health or social care.

In all the articles of this review, the teachers aim to explore the socio-cultural dimension of collaborative writing activities mediated by technology. The goal is to transform this educational experience into a moment of discovery of attitudes and behaviors such as engagement, motivation, and attention. Additionally, it is a moment of collective correction and rewriting, which strengthens cognitive and non-cognitive skills. The contribution of technology has facilitated social learning and transformed the school context, promoting better relationships and the development of collaboration and cooperation skills (Guzman & Rojas-Drummond, 2012). Investing in collaborative and technology-mediated educational actions is suggested by this evidence because they can generate qualitatively better learning experiences and reduce non-learning times. The exploration of the social and relational dimension served to help the students in the process of self-knowledge and self-awareness of their needs, expectations, and attitudes in the classroom. In many cases, teachers have used mediated collaborative writing, with specific disciplinary purposes or to verify the organization of the texts produced, the use of language and vocabulary, grammar, and the fluency of texts [A, K, and M]. In this sense, the formative experiences have once again provided confirmation of the evolutionary advantages of technology-mediated collaborative writing, already highlighted by Zhang et al. (2022) and Miyazaki (2019), in terms of the development of active and passive vocabularies, i.e., terms used in everyday language, of those whose meaning is known and fits correctly into a sentence, and of terms that are not known at all, to which he must perform the natural explanation.

For collaborative writing activities, the Google doc app [S, L, M] or Edmodo software [A] or web platforms such as wiki, Storybird 2.0 [K], and Kbp [MN] were often used. In some cases, reference is made to the use of digital technology but does not specify which [V, G]. Only two papers highlight practices in which a control group was used together with an experimental group [A, D]. The other articles do not refer to a control group.

All the articles highlight the objectives achieved, although some suggest that this is more of a perception than a real observation [L, M, V], especially since all the studies were of short duration and it is difficult to measure with certainty the real learning. Reference is made to an improvement in the use of written language, particularly in the fluency of the text, especially when it comes to using a foreign language [A, K], in some cases even compared to face-to-face writing [29]. Contributions referencing the use of Google doc [S, L, M] explicitly refer to the app's benefits on writing skills, as it facilitates interactivity, feedback, and peer review and offers access to multiple resources such as an online dictionary and grammar checkers (Hafner & Ho, 2020).

Some studies show an improvement in enthusiasm, digital literacy, social skills, motivation, concentration, and writing skills, especially due to the ease of use of some tools and some apps such as Google Docs [S, L, M, G] which, according to students, promotes greater autonomy and control over their work [L, M], as well as a sense of self-efficacy. The implication is psychological. Greater awareness of one's abilities and involvement in collaborative action, with the conviction of being able to achieve goals, exponentially accelerates motivation and commitment to overcome obstacles. It also enhances the ability to trust difficulties and to overcome conflicts and tensions between peers. A positive mindset can lead to a transformation in posture that results in greater commitment and involvement (Fathi & Rahimi, 2022; Piniel and Csizér, 2015). This can lead to a more relaxed and positive atmosphere. When fully engaged in a task, individuals

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may experience increased self-efficacy and self-confidence, which can be reflected in the quality of their interactions and the collaborative experience.

The use of Google Docs for collaborative writing had a significant impact on pupils' motivation, enthusiasm, and development of skills in personal, social, learning to learn, and digital areas. This effect was particularly notable when writing with digital technology was further mediated by music [L]. The impact of technology-mediated collaborative writing on work engagement has been significant. Collaborative writing has resulted in an equal distribution of workload and criticalities among all participants. Music can act as a didactic mediator, helping students to feel at ease and creating a comfortable and relaxing space. It can also aid in self-analysis, self-awareness, understanding of educational needs, creativity, and the ability to imagine original cognitive artifacts. In this case, it was used to create a song lyric. The possibility that this type of activity offers to build cognitive artifacts together, to publish what has been written or to share it with other people who are in other places [L, K, G], is very fun and creative for children as well as being useful to create a sense of belonging and to transform the knowledge of each student into a common heritage. This factor represents an added value especially in the learning of languages other than those spoken and written [S, V]. This way of working, in fact, fosters social connections and social identity [L] according to which students working together shape individuals' attitudes, beliefs, and behavior when they are internalized as social identities (Ng et al., 2018; Tajfel, 1978), which, in turn, by fostering a sense of belonging and collaboration, improve individual health and well-being (Jetten et al., 2009).

Through the reading of the articles, it is possible to highlight the difficulties that students and teachers have encountered in carrying out the activity: the problems of Internet connection and digital literacy have been the most highlighted to the point that it is suggested for future practices to adequately train students and teachers to allow them to carry out this type of activity in the best possible way. The lack of digital training was strongly inhibiting in some cases [S, K, V]. It was also difficult for each student to assign roles and accept and tolerate attitudes and behaviors of classmates in the same group, but also to prepare texts [L, K, and G].

The difficulties in the organization of activities and the management of groups suggest that future practices should adopt a script of rules capable of giving order to activities [L].

It should be noted that many contributions face a common challenge in elaborating and organizing collaborative writing activities that are mediated by technology. This has resulted in published research that is less relevant to the topic. The possible causes of this difficulty are not clearly referenced, but it can be inferred that the coronavirus pandemic has played a role in two ways. The purpose of this task is to expand the range of research topics related to the pandemic. Additionally, the aim is to increase the complexity of the writing process and coordination and encourage collaboration among individuals who may not be familiar with synchronous, asynchronous, or blended teaching methods. The pandemic initially caused significant disruption to school teaching, which had to rapidly adopt new delivery methods. However, it has also highlighted the potential for a wide range of educational and didactic actions to be carried out remotely. This future path is crucial. It is important to demonstrate the potential for flexibility and inclusiveness of hybrid and digital teaching when it is fully governed by shared rules and delivered in a fair and just way, meeting the different needs of each user.

5. Discussion

According to Biria and Jafari (2013), children often find writing to be a tedious task, particularly when it is used to assess their grammar and language skills rather than to express their creativity. Writing requires students to organize their ideas and utilize appropriate vocabulary. However, when technology is used as a medium for writing, students are more willing to engage in the activity as it becomes more enjoyable and allows for greater creativity and innovation. The activity is made less demanding for students by the ability to connect with people from different places and write at any time. These factors encourage children's involvement and curiosity. From a pedagogical perspective, it is important to highlight some interesting and original aspects. From reading the articles, it is evident that collaborative writing, mediated by technology, is a moment in which the teacher's control decreases. This is because one of the objectives is to increase the level of autonomy of the pupils. Collaborative writing can result in connective and collective intelligence (Levy, 1996; Heylighen, 1999), which facilitates the circulation of information, improves the quality of the final product, and promotes learning. This original aspect has not yet been explored in the literature on the subject. Another noteworthy aspect is that this type of activity is well-suited for developing children's natural inclinations toward different roles. Collaborative writing, mediated by technology, has brought out gregarious and leadership personalities in almost all contributions. These personalities can synthesize, resolve conflicts, and converge on common solutions. Additionally, some pupils tend to be emulated more than others. Both the first and second aspects indicate that technology-mediated collaborative writing can effectively create greater familiarity and interdependence among the subjects involved in the training experience. This is due to a more relaxed atmosphere when the activity is governed by an accepted set of rules. It is important to maintain a clear and concise writing style, avoiding complex terminology and ornamental language. Additionally, it is crucial to adhere to conventional academic structure and maintain a formal register throughout the text. Finally, the text

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should be free from grammatical errors, spelling mistakes, and punctuation errors. The atmosphere created in the classroom promotes a safer environment, making pupils feel more comfortable and fostering greater trust [L]. Individual and group work enhances the social and relational dimension of the children. In some cases, they are required to resolve conflicts, which helps to cultivate patience and understanding and fosters a team spirit, allowing for work to be done in a serene and pleasant atmosphere [A, S, L]. Several articles [A, L, K, M] have identified a critical issue regarding the lack of pedagogical preparation among teachers and digital skills among students. This issue has the potential to reduce the positive effects mentioned above, making quality training necessary for both teachers and students, in both technological and humanistic aspects. Digital education can bridge the skills gap that complicates collaborative writing activities carried out at different times and places. Humanistic education can be useful for both teachers and students, ensuring a commitment to responsibility, collaboration, motivation, and deep involvement. In collaborative activities, it is crucial to maintain good relationships, listen to needs, accept limitations, and promote a calm classroom atmosphere. Effective management of student behavior requires a balanced and authoritative approach that considers emotions. These factors are essential for achieving good results in collaborative writing, both in terms of writing skills and the development of skills that are reflected in the quality of collaborative work. Humanities education can also be a useful tool for young people to interpret the dynamics of collaborative writing and the content they produce. The capacity to comprehend one's writing aids in self-discovery and reflection. This can facilitate changes in attitudes, behaviors, and even fundamental values.

Conclusions

Technology has become a tool for facilitating children's needs and a key factor in making work in the classroom and at home more efficient and engaging. Technology-mediated collaborative writing requires further experimentation to detect the relationship between various variables that can affect the activity, such as its duration, the number of participants, the method used, cultural differences among students, and emotions. This research will broaden the epistemology of collaborative activity and shared knowledge construction.

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