

Collaborative work in the performance of the panpipes in university students in times of semi-presenciality

Olga Mendoza-León¹, Iris Liliana Vásquez Alburquerque¹, Yoya Betzabé Flores Pérez²,
Joselito Moisés Luján Miguel¹, Wilson Hugo Chunga Amaya³, José Wualter Peláez Amado¹

¹Academic Department of Sciences Education, Faculty of Education, National University Trujillo, Trujillo, Peru

²Academic Department and Faculty of Social Sciences, National University of Trujillo, Trujillo, Peru

³Professional School of Law and the Academic Department of Humanities, Faculty of Political Science and Law, Universidad Privada Antenor Orrego, Piura, Peru

Article Info

Article history:

Received Jul 27, 2024

Revised May 8, 2025

Accepted May 20, 2025

Keywords:

Attitude

Blended learning

Collaborative work

Feedback

Students' discourses

ABSTRACT

In the context of blended learning and music education, difficulties were identified in the learning of traditional instruments, such as the panpipes, due to the absence of collaborative methodologies that encourage teamwork. This study was conducted with the objective of improving the performance of the panpipes in university students through collaborative learning, promoting a positive attitude towards cooperation and a constant feedback process. The research included the participation of 46 students and was developed under a qualitative approach, using the action research method. For data collection, techniques such as participant observation, discourse analysis, taking photographs and grounded theory were used. The findings showed significant discursive patterns and revealed students' perceptions and interactions during the process. The implementation of collaborative strategies fostered active participation, negotiation, and joint construction of musical knowledge, while continuous feedback improved both students' attitudes toward learning the panpipes and their musical performance. In conclusion, collaborative learning was shown to be an essential methodology for more effective music teaching.

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



Corresponding Author:

Olga Mendoza-León

Academic Department of Sciences Education, Faculty of Education, National University Trujillo

Trujillo, Peru

Email: omendoza@unitru.edu.pe

1. INTRODUCTION

In 2019, the world faced the COVID-19 pandemic, which led to a drastic change in the educational field, moving from face-to-face to virtual teaching. Faced with this situation, creative methodologies emerged to work in virtual and blended environments, so that students can learn. Such as collaborative learning, which refers to the development of a learning structure through interaction, exchange of ideas and knowledge among group members performing a task with the aim not only to complete the task but also to develop individual and group skills by exchanging roles [1]. It is essential to employ collaborative learning strategies to obtain positive results, collaborative teaching emerges as a promising strategy that encourages the active participation of students [2]; it should also be mentioned that collaborative learning transferred to virtual contexts, produces a great challenge for both teachers and researchers because qualitative and quantitative methods are used to evaluate the results of its effectiveness or failure of use. Therefore, the implementation of collaborative learning is crucial and necessary for the diagnostic evaluation with differentiated group tasks that regulate and motivate the achievement of learning [3].

It is worth mentioning that the theory of collaborative learning is the most characteristic expression of social constructivism in education. In fact, it is not a single theory, but a set of theoretical lines that emphasize the constructive value of socio-cognitive interaction and mutual coordination among students. Three of these currents deserve special mention because they are the fundamental sources of collaborative learning theory: neo-Piagetian social constructionism or socio-cognitive conflict theory, the neo-Vigotian approach to intersubjectivity, and the distributed cognition or network thinking model. These three currents can be placed on the “individual-group” axis, depending on whether the emphasis is on the individual or on the interaction with the group itself [4]. The world of work more frequently requires collaborative skills that foster interpersonal relationships, since collaboration is considered an adequate response to break with old paradigms, i.e., the individualism that prevails in different times and contexts [5].

In the development of collaborative learning, various strategies can be applied and evaluated [6]. These can be of different themes and subjects, improving the educational process [7]. The evaluation of collaborative work not only favors academic development, but also emotional development, especially in the face of the accelerated transition experienced by the education sector from 2020 onwards [8]. The design of virtual activities for group learning requires the use of attractive technological tools with accessibility features. These multimodal tools serve to adapt to different learning styles and are relevant to combine cognitive aspects with the learning experience [9]. In addition, when interacting, it is essential to measure the variable of motivation and collaboration in students, since these variables are necessary for their growth and development in each class session. In this study, Google Documents was used to write in collaborative groups, similar to other studies [10]. In this way, when teaching online classes, new strategies can be developed that are currently known as learning communities [11].

Similar to the case described, in China, blended collaborative learning communities were developed, defined as when the face-to-face and the online modality are combined, in this study the synergy and strengthening of knowledge through this teaching modality was recognized, as presented in the case of the mixed analysis in which it was found in the coded qualitative responses, the prevalence of interacting: checking answers, answering questions, receiving feedback from the teacher and from their peers [3]. Another case to mention is that of young Danish nationals who experienced difficulties when interacting face-to-face with an English-speaking teacher, resulting in poor pedagogical interaction during the teaching-learning process. The strategy implemented consisted of co-constructed sense-making that promoted shared practice to generate multilingual meanings [12]. The mentioned cases are an example that when working collaboratively, fundamental human skills are strengthened, such as self-knowledge, creative thinking, interpersonal relationships and decision making [13]. Another case in London, where an experience of collaborative music teaching was recorded in COVID-19, with the participation of students, parents, coordinators, assistants, it started online, then went to hybrid and combined with face-to-face interaction [14]. Collaborative learning is one of the contemporary efforts that has been positioning in educational innovation, particularly for instructional practices related to information and communication technologies [15].

At the National University of Trujillo-Peru, the creation of a musical ensemble composed of wind instrument players, such as the *zampoña* or folk music repertoire, was a great challenge. The *zampoña* is a very old wind instrument that in its beginnings had 100 pipes, as mentioned in the fable of Polyphemus and Galatea by Góngora, later, its design was restructured, remaining in 11 pipes [16]. In the music workshop, the teaching of the music subject was part of the professional training in its curriculum, and offering the course in a blended learning modality led to the use of active strategies. When reviewing previous experiences on how to approach this task, we discovered that collaborative learning was the cornerstone of the process. We took into account various collaborative learning experiences of online music teaching in conservatories in Asia, Europe, and United States, where teachers pointed out, they were implementing technological tools as traditional for planning, preparing material and discovering new ways of teamwork [17]. In this context, the need arose to encourage collaborative learning, combined with a positive attitude and a process of constant feedback, to improve the performance of the panpipes in university students. Three key aspects were identified: the technical difficulties that students face when learning to play the panpipes, the influence of teamwork on their musical development, and how constant feedback contributes to improve their attitude and musical performance.

On the other hand, we can also highlight that when musical practices are performed with students in the teaching process, collaborative and participatory behaviors are required, in listening, interpretation, composition and improvisation either in live concerts or recordings [18]. It is necessary to promote peer learning, indicating that it is based on social constructivism, because they interact with each other, however, it is important, in order to develop it, to know the components that make it up as motivation and interpersonal skills [19]. Likewise, if we analyze the methodology used to develop collaborative learning in face-to-face contexts, we find a case where it is called interactionist model of dynamic evaluation that consists of discussing a topic with the support of interactionist techniques [20]. Collaborative learning can also be done

in small groups using the Smart Group tool to form peer groups and peer assessment [21]. Working in small groups generates new perspectives, contributing to the development of knowledge of weaker students [22]. This research also highlights the contribution of teamwork, and how a good team can achieve successful learning, which requires students to participate in the regulation, monitoring, control and redirection of emotional and cognitive processes [23]. On the other hand, scientific evidence records the influence of the so-called “lone wolf” students who, when they lack patience and commitment to their work team, affect the attitude and satisfaction of the team within a classroom [24].

Faced with the described reality, the general objective was to improve the performance of the panpipes in university students through collaborative learning, promoting a positive attitude towards teamwork and a process of constant feedback. The specific objectives are: i) to identify the main difficulties faced by students in learning the panpipes and their impact on musical performance; ii) to implement collaborative work strategies to develop musical skills and encourage the active participation of students in the learning process; and iii) to evaluate how constant feedback within the team contributes to improve the students' attitude towards learning the panpipes and their musical performance.

2. METHOD

For this research, a qualitative research approach was developed, using action research methodology. Action research is a self-reflexive spiral, where the phases of planning, action, observation and reflection are vital, and occur in a flexible and cyclical manner throughout the process [25]. Action research seeks to act on recognized situations to produce an improvement, considering the point of view of those who participate and interact in the recognized situation. Although there are various models in this type of research, they all have aspects in common, the most significant being “the interest in intervening in praxis in order to improve it” [26]. For the collection of qualitative data, techniques such as participant observation, in-depth interview and discourse analysis were used [27].

2.1. Characteristics of the participants

In the year 2022, semester I, took the music workshop 46 participants, all were of the female gender. They came from the education program at the National University of Trujillo-Peru. For the development of the semi presential and asynchronous workshops, information was requested to know the access to technological resources and thus, to be able to organize the work. The information obtained showed that 71% of the students have access to technological resources, whether laptop, computer or tablet, while 29% only have a cell phone.

2.2. Working conditions

Classes were given alternately one week face-to-face and one week virtual for a period of 17 weeks. Teams were formed in which they had to work both individually and as a group on diaphragmatic breathing, the correct blowing of the 13 tubes, the correct tuning of sounds, the correct posture and the memorization of the melodies they had to learn. Therefore, it was proposed as an objective to organize them in collaborative learning groups according to their progress by levels and thus achieve the execution, as a product of the workshop, of five folk songs, which in the course of the workshop were analyzed through participant observation and discourse analysis.

2.3. Phases of the action research applied to collaborative learning in the performance of the panpipes

The methodology in the phases of planning, acting, observing, and reflecting allowed the development of a continuous cycle of improvement in the educational process. In the planning phase, clear objectives, intervention strategies and necessary resources were defined, ensuring that the actions were aligned with the pedagogical purposes and the needs of the students. The action phase involved the implementation of the planned activities and strategies, promoting active and meaningful learning. In the observe phase, data on the development of the intervention was collected and analyzed, evaluating the progress, challenges and reactions of the students. Finally, in the reflection phase, a critical analysis of the results obtained was carried out, which allowed adjusting and improving the strategies applied in future interventions, thus strengthening the teaching-learning process in a constant and evidence-based manner.

2.4. Data collection instruments

The use of data collection instruments, such as the participant observation guide and discourse analysis, was carried out with the objective of capturing and understanding in depth the dynamics and behaviors in the educational context. The participant observation guide allowed the researchers to actively integrate into the environment, directly observing the interactions and attitudes of students and teachers in real learning situations. This method was used to obtain detailed and contextualized qualitative data that

facilitated a more complete analysis closer to the reality studied. Patterns of behavior were identified; the impact of pedagogical strategies was evaluated and informed decisions were made that contributed to improving educational practice based on observational evidence. The research considered phases, actions and activities carried out, which are detailed in Table 1.

Table 1. Action phases and activities carried out

Phase	Action	Activities
Phase 1: planning	To design a collaborative teaching strategy for learning the panpipes	Conduct a diagnostic assessment to identify students' current skills and specific difficulties in playing the panpipes. Divide students into collaborative groups, assigning roles and responsibilities within the group (leader, guide musician). Plan group practice sessions that include the performance of basic melodies and cooperative dynamics. Define the feedback mechanisms (group and individual) that will be used to reinforce learning.
Phase 2: act	Implement the collaborative teaching plan with students	Execute the planned sessions, focusing on collaborative learning through group practice of melodies. Assign a leader in each group to guide the performance and promote interaction among members. Apply continuous feedback within the groups, allowing students to correct each other and improve their skills.
Phase 3: observing	Monitor and evaluate student progress and group dynamics	Observe and record the individual and group progress of the students in playing the panpipes. Evaluate how collaborative work is influencing students' attitudes towards musical learning. Record interactions between students, the effectiveness of assigned roles, and the impact of feedback.
Phase 4: reflect	Analyze the results and adjust the teaching plan according to the observations	Bring the teaching team together to analyze the data collected in the previous phases and discuss the strengths and weaknesses of the implementation. Identify which aspects of collaborative learning were most effective and which areas need adjustment. Propose improvements and adjustments to group dynamics and feedback strategies to optimize learning.

2.5. Objectives

The overall purpose of this observation was to understand how interactions between students developed during collaborative activities that integrated the use of the *zampoña*. To this end, the following specific objectives were set: i) Observe and record student interactions and discourse during collaborative activities involving the use of the *zampoña*; ii) Identify patterns of communication, negotiation, and decision-making that emerged within the working groups; iii) Analyze the influence of the *zampoña* in promoting collaborative work and collective knowledge construction; and iv) Understand students' perceptions and experiences regarding the use of the *zampoña* in a blended learning environment. To achieve the proposed objectives, the following key aspects were observed, organized into thematic categories that allowed for a comprehensive analysis of the phenomenon:

a. Group dynamics

Attention was paid to how students organized and cooperated within their groups. The roles that each member assumed, the levels of participation and commitment, as well as the communication and negotiation strategies employed were observed. In addition, how conflicts were managed and how collective decisions were made during the activities were analyzed.

b. Use of the *zampoña*

The students' familiarity with the instrument was evaluated, as well as their technical skill. How they explored its sound and expressive possibilities was observed, as well as how the *zampoña* was integrated into the proposed activities. Its role in promoting collaborative work and its influence on group dynamics were also investigated.

c. Interactions and discourse

The dialogues and conversations that arose during the activities were also analyzed. Special attention was paid to the use of specific vocabulary related to the *zampoña* and music, the expression of ideas, opinions, and prior knowledge, as well as the processes of negotiating meanings and constructing shared knowledge among students.

d. Blended learning context

On the other hand, the educational environment in which the activities took place was taken into account. We observed how students adapted to the blended learning format, the challenges and opportunities they perceived in this context, and the strategies they used to maintain effective communication and collaboration. The impact of the environment on group work dynamics was also evaluated.

e. Data collection and ethical considerations

To support the analysis, various methods of information collection were used. These included: detailed field notes, audio and/or video recordings (with prior consent), photographic records of the activities, as well as the collection of materials and products generated by the students during the sessions. Finally, compliance with fundamental ethical principles was ensured throughout the research. This involved obtaining informed consent from all participants (students and teachers), ensuring the confidentiality and anonymity of the information collected, and respecting the principles of beneficence and justice throughout the research process.

Discourse analysis, as seen in Table 2, was conducted in order to interpret and understand the implicit and explicit meanings in the participants' verbal and non-verbal communications, especially those that reflected their perceptions, attitudes and values in the educational context. This analysis allowed us to unravel how the subjects constructed and expressed their experiences and opinions, revealing power dynamics, cultural influence and affective factors that impacted their learning and school coexistence. By conducting the discourse analysis, it was possible to obtain a deeper insight into the underlying aspects of the interactions, providing critical data to design pedagogical strategies that respond more effectively to the needs and characteristics of the students.

Table 2. Discourse analysis

Item	Aspects to consider
Feedback	On technical proficiency in playing the instrument, ability to follow musical instructions, interpretation of traditional melodies.
Attitudes	Attitude of perseverance, collaboration and respect in the music group, willingness to continuous learning.
Theoretical and methodological approach	The theoretical approach used for discourse analysis (appropriate and consistent) with the research objectives will be taken into account. Evaluation of the methodology used for the collection and analysis of discursive data (rigorous and systematic).
Transcription and organization of the data	Verification that the transcriptions of student interactions and discourses are accurate and detailed. Verification that the organization and coding of the discursive data facilitates their analysis and interpretation.
Identification and analysis of discourse patterns	Evaluation of relevant discursive patterns, such as types of utterances, turns of speech, grammatical structures, vocabulary used. Analyze whether the interpretation of these discourse patterns is well grounded and related to the research context.
Relationship between discourse and collaborative work	To examine how the connection between the analyzed discourses and the promotion of collaborative work through the use of the panpipes has been established. To evaluate if the discursive strategies used by the students to negotiate, coordinate and construct knowledge in a collaborative way have been adequately identified.
Contextualization of the analysis	Assess whether relevant contextual factors have been considered, such as the semi face-to-face environment, the characteristics of the participants, and the type of activities carried out. Analyze whether the interpretation of the speeches adequately takes into account these contextual factors.
Evidence	Review whether sufficient evidence and examples from the analyzed discourses have been provided to support the interpretations and conclusions. Evaluate whether the examples selected are representative and adequately support the findings of the analysis.
Rigor and consistency	Examine whether the discourse analysis has been carried out rigorously, systematically, and consistently with the research objectives. Assess whether the conclusions and recommendations derived from the analysis are adequately based on the findings obtained.
Rigor and consistency	Examine whether the discourse analysis was conducted rigorously, systematically, and consistently with the research objectives. Assess whether the conclusions and recommendations derived from the analysis are adequately based on the findings obtained.
Contribution to knowledge	To assess whether the discourse analysis conducted contributes new knowledge or insights into the relationship between panpipe use, collaborative work and student discourses in a semi-face-to-face context.

*The instruments were applied via drive and later transcribed for qualitative analysis.

3. RESULTS

Objective 1 is about identify the main difficulties faced by students in learning the panpipes and their impact on musical performance. The action research phase plan and act was taken into account. The results are presented organized taking into account the analysis of the instruments used such as the participant observation guide and the discourse analysis, as shown in Table 3.

Table 3. Analysis of the results of the participant observation guide

Category	Sub-categories	Interpreted quote	Participants
Group dynamics	Roles taken by group members	They mention specific roles such as marking the beat, marking the rhythm, playing the main melody and accompanying with the bass drum.	P1 and P2
	Levels of participation and commitment of each member	Emphasizes the importance of the levels of participation and commitment to progress in the performance of the panpipe. Mentions that they worked as a team because of the group's union and previous experience of working together.	P13
	Communication and negotiation strategies used	They created a group on a WhatsApp messaging application to maintain communication and organize collaborative tasks. They emphasize the importance of effective communication and being clear and direct to avoid misunderstandings.	P5 and P14
	Conflict management and decision making: There is no direct mentions of conflict management.	She made the decision to work as a team due to the union and previous experiences.	P3
Use of the panpipes	Students' familiarity and skills with the instrument	At first it was difficult to follow the rhythm, but she improved with practice and the input from her peers. The panpipe was not a familiar instrument and they did not have many skills at the beginning.	P8 and P23
	Exploring the sound and expressive possibilities of the panpipe	They learned a repertoire of Christmas carols on the panpipe. They recorded performances to analyze and improve their coordination.	P42 and P9
	Relationship between the panpipes and the promotion of collaborative work	The panpipe was a valuable tool for fostering collaboration, with everyone contributing their skills. They mention the group performances and the excitement of playing in tune together.	P7 and P43
	Integration of the panpipes in the proposed activities and tasks	In the semi-face-to-face classes, they commented that they alternated theory, individual practice and group practice with the panpipe. The teacher assigned tasks and interactions related to the panpipe.	P6 and P20
Interactions and speeches: student	Dialogues and conversations during collaborative activities	They mention that as a group they could confirm whether the sounds were correct when practicing the panpipes. they share the anecdote of his mother who complained about repeating a song all day long.	P2 and P25
	Use of specific vocabulary related to the panpipes and music	They acquired vocabulary such as "quarter notes", "eighth notes", "sixteenth notes", "repeat bars" and "sheet music".	P7 and P8
	Expressing ideas, opinions and prior knowledge	She expresses her initial difficulty in adapting to the blended classes. She found it difficult to maintain concentration in the virtual sessions. The most difficult thing was to coordinate group work because of the availability of schedules.	P1, P2, P4
	Negotiating meanings and constructing shared knowledge	There is no direct mention of the negotiation of meanings or the construction of shared knowledge.	P7
Other relevant interactions and speeches	She enjoyed playing the panpipes in groups and practicing together to achieve the melody.		P13
	She mentions that playing the panpipe is a bit dizzying as she is not used to such loud and long sounds.		P40
	They emphasize the importance of respecting confidentiality and obtaining the participants' consent before recording activities.		P10 and P11
	The semi-face-to-face nature forced them to be more organized and responsible with individual and group tasks.		P12
	They miss the face-to-face interaction with their peers in the semi face-to-face environment.		P15
	They have found new ways to collaborate and learn together through virtual platforms.		P16 and P19
	They mention that playing the panpipes is a bit dizzying as they are not used to such loud and long sounds.		P45
	They emphasize the importance of respecting confidentiality and getting participants' consent before recording activities.		P10 and P11
	The semi-personality forced them to be more organized and responsible with individual and group tasks.		P12

The research results show that the use of the *zampoña* fostered effective group dynamics, in which students assumed specific roles and improved their skills through practice and mutual support, overcoming initial unfamiliarity with the instrument. Constant communication through a messaging platform facilitated the organization of tasks, while the blended environment promoted the development of personal responsibility and organization. In addition, dialogue in the group allowed them to validate interpretations and acquire musical vocabulary, enriching both their theoretical and practical learning. Taken together, these elements underscore the role of the *zampoña* in strengthening collaboration and active learning in the classroom.

Objective 2 is about the implement collaborative work strategies to develop musical skills and encourage the active participation of students in the learning process. The phases of action research, act and observe were taken into account. The work strategies were developed during the 17 weeks, which are summarized in Table 4. These results highlight the importance of implementing strategies that strengthen communication, active listening, collaboration and equity in teamwork in educational environments. Brainstorming promoted a space where all students could express their proposals for improvement in a collaborative and virtual work environment, enriching participation and the exchange of ideas. The mediated transmission of opinions allowed, both in face-to-face and virtual environments, students to practice active listening, respecting rules of coexistence and netiquette, which was fundamental to develop respectful and effective communication. Group evaluation promoted self-evaluation and reflection, allowing students to identify their achievements and challenges, and to commit to continuous improvement in group work. Finally, symmetry in participation ensured that all group members had the opportunity to assume leadership roles, thus promoting equity in collaborative dynamics and strengthening the sense of responsibility and belonging in the group.

Table 4. Strategies promoted

Strategies	Objective	Description
Brainstorming	Stimulate communication and participation	Work was done virtually, work groups were formed, and the teacher proposed as a topic how they could improve their work. The responses of the different groups were compared.
Mediated transmission of opinions	Improve listening	The work was carried out virtually and in person, in work teams, and the participants expressed their opinions using the rules of coexistence and netiquette.
Group evaluation	Improving group work	In working groups, members mentioned their achievements and difficulties. Each member was evaluated and made commitments to improve.
Symmetry in participation	Equity in participation.	Participants alternated leadership roles in the group.

The photographs of the collaborative work carried out in the music workshop classes, using collaborative strategies. The study took place in the music workshop classroom where an analysis of the development of musical skills and participation was carried out through participant observation and discourse analysis. Figures 1-5 show the performance of the folk music repertoire with the *zampoña*. The students' participation in group practice was fundamental, as it allowed them not only to become familiar with the rhythmic and melodic characteristics of this genre, but also to understand the cultural and social value it represents. Collaborative learning played a key role in this process, since, by previously studying each piece, the students used strategies such as role distribution, alternation in leadership and active listening, which facilitated the identification of technical particularities and the coordination of rhythms in the ensemble. These strategies fostered a more harmonious performance and a mutually supportive environment. In addition, the collaborative process strengthened listening skills and respect for musical tradition, reinforcing the sense of cultural identity and group cohesion in the learning and performance of the *zampoña*. Students correcting in teams the practice of diaphragmatic breathing, blowing the 13 pipes of the *zampoña*, improving the intonation of the sounds, correcting the correct posture and achieving the memorization of the melodies they had to perform.

Objective 3 is about to evaluate how constant feedback within the team contributes to improve the students' attitude towards learning the *zampoña* and their musical performance. Reflexional action research phase was carried out. Discourse analysis, as shown in Table 5, in this research was essential to understand how the panpipes learning process and collaborative work impacted the development of students' technical and social skills. In terms of feedback, the student improved in coordination, intonation and rhythmic control, adjusting as he received correction and support from the teacher. Attitudes showed his constancy, effort and willingness to practice outside of class, along with a respectful and constructive attitude towards his classmates. From a theoretical-methodological approach, the analysis integrated discourse theories, applied linguistics and psychology, allowing the identification of discursive patterns and specific musical vocabulary

such as “crotchets” and “eighth notes,” used in dialogues and collaborative activities. In addition, discursive interactions were explored to facilitate the construction of roles and collaborative strategies, strengthening group dynamics. The contextualization of the discourse allowed us to understand aspects of cultural identity, musical traditions and the semi-presential context that shaped the educational practices. Through a rigorous and coherent analysis that included triangulation of sources and interpreted quotations, the study evidenced coherence in its interpretations, contributing to the knowledge about collaborative work in blended environments and offering bases for future research on the use of the panpipes in education.



Figure 1. Students analyzing the folk music repertoire (*zampoña*)



Figure 2. *Zampoña* practice in a recording studio



Figure 3. Students interacting collaboratively with a guest harpist to practice the musical repertoire to be performed



Figure 4. Group of participants after a presentation



Figure 5. Participants with panpipe instrument in protocol activities at the Faculty of Education and Communication Sciences of the National University of Trujillo

Table 5. Discourse analysis

Category	Interpreted result
Feedback	The student demonstrated improvements in hand coordination and air control; followed the teacher's indications regarding rhythm and pauses; modified his performance after receiving feedback on rhythmic errors; improved intonation and melodic fluency as correction and support were provided.
Attitudes	The student showed constancy and effort during rehearsals, even when faced with technical difficulties, practiced outside class hours to improve his mastery of the instrument, Provided constructive suggestions to his classmates in a respectful manner.
Theoretical and methodological approach	Theoretical and discourse analysis, applied linguistics and psychology perspectives were combined in the participants' discourses.
Identification and analysis of discourse patterns.	Specific vocabulary was used: crotchets, eighth notes, and sheet music. In addition, expressions of ideas and opinions, used dialogues and conversations during collaborative activities.
Relationship between discourse and collaborative work.	Group dynamics, role-playing, participation and strategies were built, which facilitated collaboration and joint learning.
Contextualization of the analysis.	Aspects of cultural identity, musical traditions, educational, institutional and pedagogical practices were identified; the blended learning modality was used for both tasks and activities.
Evidence	Interpretation quotes of the observations were analyzed. Systematically coded and analyzed the data.
Rigor and consistency.	Bibliographic sources interpreted quotations and photographic analysis were triangulated. Internal and external coherence was evidenced in the interpretation of the data.
Contribution to knowledge.	Collaborative work and the use of the panpipes in semi-presential environments were understood, as well as practical and theoretical implications and lines of future research.

4. DISCUSSION

The performance of the *zampoña* was carried out in synchronous and asynchronous learning environments. Through the virtual classroom, students worked in groups that received feedback on the videos shared on the platform, evaluating aspects such as feedback, attitude and commitment of each member. This evaluation highlighted the relevance of teamwork for the construction of new knowledge. Thus, it was identified that collaborative work has been consolidated in virtual classrooms, which poses great challenges for both teachers and students in terms of adaptation and effectiveness [28]. The results underline the need to promote active learning strategies, in particular collaborative learning, to optimize student participation in distance learning environments [29]. Also, instrument learning in a blended learning context requires an innovative approach, integrating mixed reality technologies. This technology combines physical and digital elements to create a more interactive and motivating practice environment, encouraging regular practice through challenges that make the process more engaging and effective for the student [30].

The collaborative work training process revealed the influence of intrinsic and extrinsic motivational factors that affected the permanence of the students in the practice of the musical instrument. Among the main barriers, lack of time and decreased interest were identified, factors that generated intentions of abandonment due to their emotional impact [31]. However, the implementation of collaborative strategies increased student engagement, promoting meaningful learning, strengthening interaction, and developing social skills. These findings highlight that teamwork not only improves content comprehension, but also creates an inclusive and dynamic environment, integrating itself as a fundamental element of modern teaching to enhance both academic performance and interpersonal skills [32]. A similar study conducted in Finland on the collaborative teaching of the panpipes showed results that confirm a positive impact on the development of both musical and social skills. In this context, collaborative practice stimulated creativity and productivity abilities, in addition to improving students' psychological satisfaction by promoting autonomy and improving interpersonal relationships, as it fosters collaboration rather than competition [33], [34]. Similarly, collaborative learning facilitates socioemotional interaction, which allows delving into students' feelings and emotions around the use and practice of the panpipes, providing a student-centered perspective on the interactive learning process.

From the observation and analysis of discourses in the synchronous and asynchronous sessions, significant changes were identified in the gestures, expressions and practices of the students during the music workshop, complemented by photographic evidence. These records showed how the use of collaborative work in the practice of the panpipes generated a remarkable integration and differentiated postures among the participants, demonstrating a progressive adaptation to teamwork. The systematic implementation of collaborative work in music education contexts stimulated students' creativity, improving learning through reflection and critical analysis of their experiences, which strengthened their musical and personal knowledge. In this sense, it was found that, in classrooms where music is developed, students exhibit greater security, responsibility, commitment and generosity, qualities that influence their interaction and joint effort in handling musical instruments, contributing to a change in their way of relating and living [35]. Furthermore, the results indicate that the combination of music and collaborative work plays a fundamental

role in the intellectual, social and personal development of young people, fostering skills that go beyond the musical realm and supporting their integral and holistic growth. Through musical practice, young people strengthen their self-confidence, creativity, and ability to collaborate, contributing to their personal development and to the strengthening of the educational community [36].

Another important finding was the perception shared by most of the students that, although music is usually studied individually, the group approach strengthens their previous knowledge and promotes cooperation. This teamwork facilitated the practice and exploration of the sound and expressive possibilities of the *zampoña*, starting with tuning and finally achieving the performance of a repertoire of five songs thanks to the implementation of collaborative strategies. The evidence obtained shows that collaborative work provides practical implications, such as taking turns and the correct distribution of roles, both essential factors for the success of the group and which influence the final results. It also highlights the importance of teams participating in activities that strengthen interpersonal relationships and contribute to the integration of knowledge, requiring both experience in collaboration and effective interaction [28].

The central finding of this study reveals that collaborative work is closely associated with the use of the panpipes as a musical instrument, promoting the development of investigative skills and creative attitudes among students from the first contact with the instrument. Each learning session motivated students to demonstrate their talent and support each other in a shared learning environment [37]. To maintain effective communication and collaboration, groups implemented practical strategies such as creating groups in messaging applications and respecting confidentiality and consent in recordings. These actions reflect the students' adaptation to the blended context, taking advantage of opportunities and overcoming challenges to achieve meaningful collaborative learning through the practice of panpipes. In this framework, collaborative work facilitated both social and affective interactions, allowing students to articulate social and learning competencies while integrating their individual experiences with the use of the *zampoña*. This generated valuable evidence about the roles that each student played, the tasks assigned, and the preferences for various strategies employed, thus highlighting the importance of this methodology in the integral development of students [38].

5. CONCLUSION

The use of collaborative work in the teaching of the panpipes in a blended learning environment proved to be an effective tool to foster the construction of shared knowledge among students. The discursive patterns, the expression of ideas and opinions, as well as the dialogues observed in the group activities, reflected an active process of negotiation of meanings and co-construction of knowledge about the performance of the panpipes and music in general, responding to the objective of overcoming the initial difficulties in learning the instrument.

By exploring the sound and expressive possibilities of the panpipes, students were able to strengthen their attitudes, skills and knowledge both individually and as a group, achieving enriching results. Despite the challenges of the blended learning environment, these were used as opportunities for collaboration and time organization. Thus, students discovered new ways to collaborate and learn through virtual platforms, such as the virtual classroom and instant messaging on WhatsApp, fulfilling the objective of implementing collaborative work strategies that promote their active participation in the learning process.

Constant feedback, both individual and group, favored an improvement in interactions and in the specific vocabulary related to music and the instrument, increasing familiarity with the *zampoña* and commitment to collaborative work. This feedback process not only facilitated the learning of musical performance, but also promoted the development of collaborative learning strategies, achieving the objective of evaluating how feedback contributes to improve the students' attitude towards learning the *zampoña* and their musical performance.

FUNDING INFORMATION

Authors state no funding involved.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Olga Mendoza-León		✓				✓		✓	✓	✓	✓	✓		✓
Iris Liliana Vásquez Alburquerque	✓		✓	✓		✓			✓		✓		✓	✓
Yoya Betzabé Flores Pérez		✓	✓		✓		✓	✓		✓				
Joselito Moisés Luján Miguel				✓	✓		✓		✓	✓		✓		
Wilson Hugo Chunga Amaya	✓	✓		✓			✓		✓		✓			
José Wualter Peláez Amado			✓	✓		✓			✓	✓		✓		

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest.

INFORMED CONSENT

We obtained informed consent from all individuals included in this study.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author [OML], upon reasonable request.

REFERENCES

- [1] C. G. Rodríguez-Borges, C. A. Bowen-Quiroz, J. A. Pérez-Rodríguez, and M. Rodríguez-Gámez, "Assessment of collaborative learning skills acquired through the knowledge integration project," *Formacion Universitaria*, vol. 13, no. 6, pp. 239–246, 2020, doi: 10.4067/S0718-50062020000600239.
- [2] O. Revelo-Sánchez, C. A. Collazos-Ordóñez, and J. A. Jiménez-Toledo, "Collaborative work as a didactic strategy for teaching/learning programming: a systematic literature review," *Tecnológicas*, vol. 21, no. 41, pp. 115–134, 2018.
- [3] L. Li, "Students' Academic Achievement and Satisfaction in a Blended Learning Community of College English in China: A Quasi-experimental Study," *SAGE Open*, vol. 12, no. 3, pp. 1–11, 2022, doi: 10.1177/21582440221119485.
- [4] R. Huang *et al.*, "Emergence of the Online-Merge-Offline (OMO) Learning Wave in the Post-COVID-19 Era: A Pilot Study," *Sustainability*, vol. 13, no. 6, p. 3512, Mar. 2021, doi: 10.3390/su13063512.
- [5] S. A. A. Ismail and K. Al Allaq, "The Nature of Cooperative Learning and Differentiated Instruction Practices in English Classes," *SAGE Open*, vol. 9, no. 2, pp. 1–17, Apr. 2019, doi: 10.1177/2158244019856450.
- [6] F. Rafi and N. Pourdana, "E-diagnostic assessment of collaborative and individual oral tiered task performance in differentiated second language instruction framework," *Language Testing in Asia*, vol. 13, no. 1, p. 6, 2023, doi: 10.1186/s40468-023-00223-7.
- [7] L. de Jong, J. Meirink, and W. Admiraal, "School-based teacher collaboration: Different learning opportunities across various contexts," *Teaching and Teacher Education*, vol. 86, p. 102925, Nov. 2019, doi: 10.1016/j.tate.2019.102925.
- [8] Y. Ito, "Examining a technology-focused language teacher community on Facebook during a crisis situation," *Asian-Pacific Journal of Second and Foreign Language Education*, vol. 8, no. 1, p. 1, 2023, doi: 10.1186/s40862-022-00159-0.
- [9] S. T. Yun, S. K. Olsen, K. C. Quigley, M. A. Cannady, and A. Hartry, "A Review of Augmented Reality for Informal Science Learning: Supporting Design of Intergenerational Group Learning," *Visitor Studies*, vol. 26, no. 1, pp. 1–23, 2023, doi: 10.1080/10645578.2022.2075205.
- [10] S. N. Shahidan, Z. Ali, and S. A. Tilwani, "Fostering Motivation in ESL Collaborative Online Writing through Google Docs," *World Journal of English Language*, vol. 12, no. 7, pp. 166–178, 2022, doi: 10.5430/wjel.v12n7p166.
- [11] A. M. Almalki and M. Sabir, "Building Learning Communities in Saudi EFL Online Classes," *World Journal of English Language*, vol. 12, no. 8, pp. 313–325, 2022, doi: 10.5430/wjel.v12n8p313.
- [12] M. V. aus der Wieschen and O. Sert, "Divergent language choices and maintenance of intersubjectivity: the case of Danish EFL young learners," *International Journal of Bilingual Education and Bilingualism*, vol. 24, no. 1, pp. 107–123, 2021, doi: 10.1080/13670050.2018.1447544.
- [13] P. D. MacIntyre, T. Gregersen, and S. Mercer, "Language teachers' coping strategies during the Covid-19 conversion to online teaching: Correlations with stress, wellbeing and negative emotions," *System*, vol. 94, p. 102352, Nov. 2020, doi: 10.1016/j.system.2020.102352.
- [14] J. Rivas *et al.*, "Voices from Southwark: Reflections on a collaborative music teaching project in London in the age of COVID-19," *International Journal of Community Music*, vol. 14, no. 2–3, pp. 169–189, 2021, doi: 10.1386/ijcm_00043_1.

- [15] T. J. Nokes-Malach, J. E. Richey, and S. Gadgil, "When Is It Better to Learn Together? Insights from Research on Collaborative Learning," *Educational Psychology Review*, vol. 27, no. 4, pp. 645–656, Dec. 2015, doi: 10.1007/s10648-015-9312-8.
- [16] J. Vélez-Sainz, "The rude pan-pipes of polyphemus: Self-representation and parody in Góngora's Fábula de Polifemo y Galatea," (in Spanish), in *"Rompa con dulces números el canto": homenaje a Antonio Carreño*, 2010, pp. 214–230. [Online]. Available: https://www.researchgate.net/publication/292623529_The_rude_pan-pipes_of_polyphemus_Self-representation_and_parody_in_Gongora's_Fabula_de_Polifemo_y_Galatea
- [17] M. Biasutti, R. A. Philippe, and A. Schiavio, "Assessing teachers' perspectives on giving music lessons remotely during the COVID-19 lockdown period," *Musicae Scientiae*, vol. 26, no. 3, pp. 585–603, 2022, doi: 10.1177/1029864921996033.
- [18] A. Schiavio, P.-J. Maes, and D. van der Schyff, "The dynamics of musical participation," *Musicae Scientiae*, vol. 26, no. 3, pp. 604–626, Sep. 2022, doi: 10.1177/1029864920988319.
- [19] M. Homayouni, "Peer assessment in group-oriented classroom contexts: on the effectiveness of peer assessment coupled with scaffolding and group work on speaking skills and vocabulary learning," *Language Testing in Asia*, vol. 12, no. 1, p. 61, 2022, doi: 10.1186/s40468-022-00211-3.
- [20] S. Bećirović, V. Dubravac, and A. Brdarević-Čeljo, "Cooperative Learning as a Pathway to Strengthening Motivation and Improving Achievement in an EFL Classroom," *SAGE Open*, vol. 12, no. 1, pp. 1–13, 2022, doi: 10.1177/21582440221078016.
- [21] M. Ritonga, F. Farhangi, B. Ajanil, and A. F. Khafaga, "Interventionist vs. interactionist models of dynamic assessment (DA) in the EFL classroom: impacts on speaking accuracy and fluency (SAF), foreign language classroom anxiety (FLCA), and foreign language learning motivation (FLLM)," *Language Testing in Asia*, vol. 12, no. 1, p. 43, Oct. 2022, doi: 10.1186/s40468-022-00195-0.
- [22] H. Zhu, N. Li, N. K. Rai, and J. M. Carroll, "SmartGroup: A Tool for Small-Group Learning Activities," *Future Internet*, vol. 15, no. 1, p. 7, 2023, doi: 10.3390/fi15010007.
- [23] T. Törmänen, H. Järvenoja, M. Saqr, J. Malmberg, and S. Järvelä, "A Person-Centered Approach to Study Students' Socio-Emotional Interaction Profiles and Regulation of Collaborative Learning," *Frontiers in Education*, vol. 7, p. 866612, 2022, doi: 10.3389/educ.2022.866612.
- [24] S. Shin, K. Kwon, and J. Jung, "Collaborative Learning in the Flipped University Classroom: Identifying Team Process Factors," *Sustainability*, vol. 14, no. 12, p. 7173, 2022, doi: 10.3390/su14127173.
- [25] A. Latorre, *Action research: knowing and changing educational practice*. Barcelona: Graó (in Spanish), 2003. [Online]. Available: <https://www.uv.mx/rmipe/files/2019/07/La-investigacion-accion-conocer-y-cambiar-la-practica-educativa.pdf>
- [26] E. A. M. Colmenares and M. M. L. Piñero, "A heuristic methodological tool for understanding and transforming socio-educational realities and practices," (in Spanish), *Revista de Educación*, vol. 14, no. 27, pp. 96–114, 2008. [Online]. Available: <https://www.redalyc.org/pdf/761/76111892006.pdf>
- [27] N. Hernández-Sellés, P. C. Muñoz-Carril, and M. González-Sanmamed, "Higher Education Teacher's Roles in Collaborative Learning Processes in Virtual Environments," (in Spanish), *RIED-Revista Iberoamericana de Educacion a Distancia*, vol. 26, no. 1, pp. 39–58, 2023, doi: 10.5944/ried.26.1.34031.
- [28] H. B. Love *et al.*, "Towards understanding the characteristics of successful and unsuccessful collaborations: a case-based team science study," *Humanities and Social Sciences Communications*, vol. 9, no. 1, pp. 1–11, 2022, doi: 10.1057/s41599-022-01388-x.
- [29] A. H. Rakha, "The impact of Blackboard Collaborate breakout groups on the cognitive achievement of physical education teaching styles during the COVID-19 pandemic," *PLoS ONE*, vol. 18, no. 1, p. e0279921, Jan. 2023, doi: 10.1371/journal.pone.0279921.
- [30] W. Molloy, E. Huang, and B. C. Wunsche, "Mixed Reality Piano Tutor: A Gamified Piano Practice Environment," in *2019 International Conference on Electronics, Information, and Communication (ICEIC)*, Jan. 2019, pp. 1–7, doi: 10.23919/ELINFOCOM.2019.8706474.
- [31] R. J. Sternberg, "Toward a triangular theory of love for one's musical instrument," *Psychology of Music*, vol. 49, no. 6, pp. 1747–1757, Nov. 2021, doi: 10.1177/0305735620961143.
- [32] K. L. Quispe, A. S. Sebrán, and L. A. Yaranga, "Collaborative work in education," (in Spanish), *Horizontes. Revista de Investigación en Ciencias de la Educación*, vol. 7, no. 29, pp. 1423–1437, Apr. 2023, doi: 10.33996/revistahorizontes.v7i29.602.
- [33] J. Haapaniemi, S. Venäläinen, A. Malin, and P. Palojoki, "Amplifying the voice of pupils: using the diamond ranking method to explore integrative and collaborative learning in home economics education in Finland," *Education Inquiry*, vol. 14, no. 1, pp. 125–144, 2023, doi: 10.1080/20004508.2021.1966888.
- [34] A. Schiavio, M. Biasutti, D. van der Schyff, and R. Parncutt, "A matter of presence: A qualitative study on teaching individual and collective music classes," *Musicae Scientiae*, vol. 24, no. 3, pp. 356–376, Sep. 2020, doi: 10.1177/1029864918808833.
- [35] M. Biasutti and E. Concina, "Online composition: strategies and processes during collaborative electroacoustic composition," *British Journal of Music Education*, vol. 38, no. 1, pp. 58–73, Mar. 2021, doi: 10.1017/S0265051720000157.
- [36] S. Hallam, "The power of music: Its impact on the intellectual, social and personal development of children and young people," *International Journal of Music Education*, vol. 28, no. 3, pp. 269–289, 2010, doi: 10.1177/0255761410370658.
- [37] A. Daubney and M. Fautley, "Editorial Research: Music education in a time of pandemic," *British Journal of Music Education*, vol. 37, no. 2, pp. 107–114, Jul. 2020, doi: 10.1017/S0265051720000133.
- [38] A. Schiavio, M. Biasutti, and R. A. Philippe, "Creative pedagogies in the time of pandemic: a case study with conservatory students," *Music Education Research*, vol. 23, no. 2, pp. 167–178, Mar. 2021, doi: 10.1080/14613808.2021.1881054.

BIOGRAPHIES OF AUTHORS



Olga Mendoza-León    is a professor of the Academic Department of Sciences Education, Faculty of Education, The National University Trujillo, Trujillo-Peru. She has been developing research in the area of digital competencies and collaborative work. She can be contacted at email: omendoza@unitru.edu.pe.



Iris Liliana Vásquez Alburquerque     is a professor of the Academic Department of Sciences Education, Faculty of Education, The National University Trujillo, Trujillo-Peru. Has been developing research in the area of artistic education and music, as well as in collaborative work. She can be contacted at email: ialburquerque@unitru.edu.pe.



Yoya Betzabé Flores Pérez     is a professor of The Academic Department and Faculty of Social Sciences, the National University of Trujillo, Trujillo-Peru. She has been developing research in the area of social sciences, social work career, as well as in collaborative work. She can be contacted at email: yflores@unitru.edu.pe.



Joselito Moisés Luján Miguel     is a professor of The Academic Department of Sciences Education, Faculty of Education, the National University Trujillo, Trujillo-Peru. He has been developing research in the areas of philosophy, psychology and social sciences, as well as in collaborative work. He can be contacted at email: lujanmmiguel80@gmail.com.



Wilson Hugo Chunga Amaya     is a professor at the Professional School of Law and the Academic Department of Humanities at the Universidad Privada Antenor Orrego Filial Piura, Faculty of Political Science and Law at the Universidad Privada Antenor Orrego, Piura-Perú branch. He has been developing research in the areas of law and political science and music, as well as in collaborative work. He can be contacted at email: wchungaa1@upao.edu.pe.



José Wualter Peláez Amado     is a professor of The Academic Department of Sciences Education, Faculty of Education, The National University Trujillo, Trujillo-Peru. He has been developing research in the areas of philosophy, psychology and social sciences, as well as in collaborative work. He can be contacted at email: jpelaez@unitru.edu.pe.