"We all contributed to tell stories to the best of our abilities": Cooperative digital storytelling to promote students' positive interdependence in an online course of Italian as a foreign language[1]

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ABSTRACT

EN Positive interdependence is defined as a mutual relationship between people who are driven to achieve the same task goals. Considered as the foundation of collaborative language learning, it can surface in group activities of digital content creation. Digital storytelling may enhance skills of positive interdependence as it enables digital narratives to be told through mixed media (Robin, 2016). However, prolonged exposure to technology might cause distraction, motivation loss, and fatigue among language students, hampering the establishment of positive interdependence. To encourage interdependent interactions in digital learning environments, this study presents the results of educational activities conducted using the *ThingLink* and *StoryMaps* platforms by learners of Italian as a foreign language during an online language course. The results stemming from online questionnaires, transcript analyses, and focus group interviews highlight how students' positive interdependence can be boosted by telling stories through immersive technologies.

Key words: DIGITAL STORYTELLING, LANGUAGE PEDAGOGY, TASK-BASED INTERACTION, TECHNOLOGY-SUPPORTED LEARNING

ES La interdependencia positiva se define como la relación recíproca entre las personas orientadas a conseguir los mismos objetivos. Considerada como el fundamento del aprendizaje lingüístico colaborativo, esta puede emerger en actividades grupales de creación de contenido digital. El storytelling digital puede mejorar estas habilidades de interdependencia positiva, ya que permite narrar las historias digitales de forma multimodal (Robin, 2016). Sin embargo, una exposición prolongada a la tecnología puede causar distracciones, pérdida de motivación y fatiga entre el alumnado, lo que dificulta que se establezca interdependencia positiva. Este estudio presenta los resultados de las actividades realizadas utilizando las plataformas *ThingLink* y *StoryMaps* por estudiantes de italiano como lengua extranjera durante un curso en línea, con el fin de fomentar las interacciones interdependientes en entornos de aprendizaje digitales. Los resultados de cuestionarios en línea, análisis de expedientes académicos y entrevistas en grupos focales resaltan cómo se puede impulsar la interdependencia positiva del alumnado al contar historias a través de tecnologías inmersivas.

Palabras clave: STORYTELLING DIGITAL, DIDÁCTICA, INTERACCIONES BASADAS EN TAREAS, APRENDIZAJE ASISTIDO POR LA TECNOLOGÍA

IT L'interdipendenza positiva è la relazione di dipendenza reciproca tra persone orientate al raggiungimento di obiettivi comuni. Considerata il fondamento dell'apprendimento linguistico collaborativo, essa traspare in attività di gruppo incentrate sulla creazione di contenuti digitali. Lo storytelling digitale può sviluppare queste abilità di interdipendenza positive permettendo di narrare racconti virtuali multimodali (Robin, 2016). Tuttavia, l'esposizione prolungata alle tecnologie può causare distrazione, perdita di motivazione e stanchezza, ostacolando il manifestarsi di interdipendenza positiva. Per incoraggiarne l'insorgenza in ambienti di apprendimento digitale, questo articolo mostra i risultati di attività educative condotte con le piattaforme *ThingLink* e *StoryMaps* da parte di studenti di italiano come lingua straniera. I risultati ottenuti da questionari online, analisi delle trascrizioni verbali e focus group, evidenziano come l'interdipendenza positiva si rafforzi attraverso storie interattive narrate con le tecnologie immersive.

Parole chiave: STORYTELLING DIGITALE, DIDATTICA, INTERAZIONI BASATE SUI TASK, APPRENDIMENTO SUPPORTATO DALLA TECNOLOGIA

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1. Introduction

Described as the practice of "telling stories with a mixture of digital media, including text, pictures, recorded audio narration, music, and video" (Robin, 2016, p. 18), digital storytelling has been at the center of many pedagogical inquiries as it stimulates students' imagination, creativity, and content memorization, as well as enhances active learning. In fact, by situating language practices in virtual contexts and allowing for the creation and interpretation of meaning through multimodal communication channels, digital storytelling platforms are likely to encourage students' collaboration in achieving activity goals (Nicoli et al., 2022). This participation may surface in goal-oriented behaviors such as mediation strategies, clarification seeking, and turn-taking. These behaviors can be considered manifestations of positive interdependence, a rapport that is established between individuals interacting to achieve mutual task goals (Johnson & Johnson, 2005). From a language education perspective, the successful establishment of positive interdependent relationships can increase linguistic production as students engage in collaborative meaning-making activities mediating the best solutions to achieve activity goals. However, as in-person education is increasingly blended with online learning, interdependent relationships in remote task-based language activities are challenged by students' potential disengagement, distraction, loss of motivation, fatigue, and cognitive overload. To counteract these phenomena, desktop-based immersion in goal-oriented language activities may nurture positive interdependence as discussions unfold during goal-oriented meaning-making activities. Specifically, non-immersive Virtual Reality (non-iVR) involves users in computer-generated experiences available on desktops and is used as a tool for remote interactions with other individuals (Cummings & Bailenson, 2016). In this respect, 360° virtual tours can be considered examples of non-iVR and will be indicated in this paper with the term Virtual Field Experiences (VFEs), coined by Oguilve et al. (2022). Reflections on pedagogy and tool usage highlight the necessity to investigate non-immersive Virtual Reality as a way to foster students' interdependence toward creating immersive and engaging digital stories. An interdependence-based inquiry on learning Italian as a foreign language is an element of novelty in the literature on educational technology, which is presented in this paper through the results of a case study on 13 participants who conducted language activities with the non-immersive Virtual Reality applications *ThingLink* and *StoryMaps*.

This study addresses the following research question: what is the impact of digital storytelling activities conducted with the use of non-iVR on the positive interdependence of students of Italian as a foreign language in online learning contexts? The underlying hypothesis postulates that using VFEs and the non-iVR-based digital storytelling application *StoryMaps* can boost students' positive interdependent relationships in online learning contexts. The study will depart from pedagogical considerations of evolving competencies underpinning tech-based language education, digital storytelling, positive interdependence, task-based language learning, and Virtual Reality. Subsequently, it will describe the methodological underpinnings and the materials used in the interventions as well as present the data collected during task-based activities. Results will be discussed in terms of measuring students' positive interdependence surfacing from meaning-making activities, clarification seeking, and turn-taking. Lastly, conclusions will prompt further pedagogical reflections on collaborative digital language learning practices and highlight potential thematic research areas for future interventions with non-iVR tools.

2. Literature review

Educational research has increasingly focused on language learning practices that are digital, interconnected, and participatory. In fact, through digital language learning, students develop various forms of literacies which are essential for professional collaborations and social interactions. These skills were initially defined in terms of reading, speaking, listening, and writing, only to be incorporated into the multiliteracies framework described by Leu et al. (2013) and Kalantzis and Cope (2012). The term multiliteracies encompasses the assumptions that: a) the development of technologies for information and communication entails changes in skillsets, strategies, dispositions, and social practices; b) students need to develop new skills to ensure their full participation in global communities; c) literacies are set to constantly change together with the technologies fostering their development; and d) new literacies are multifaceted. Thus, a key element of language pedagogy is represented by students' interconnection and participation, which constitute the backbone of cooperative language learning. In fact, with evolving digital language learning practices, social skills, and meaning-making are developed through foreign language acquisition and production. Hence, language activities become opportunities to explore, evaluate, create, and conceptualize digital materials (Kalantzis & Cope, 2012; Paesani et al., 2015). This has encouraged the creation of learning experiences of

collaborative digital storytelling for students to express their agentive capabilities through shared and multimodal communication channels.

By allowing users to combine digital media in online platforms to share their life experiences, digital storytelling can foster multimodal language production in collaborative activities. From a pedagogical perspective, conducting group-based digital storytelling tasks can encourage the development of critical thinking skills and coherent narratives in the target language. Students can craft sharable narratives of personal and instructional content through an integrated language learning approach fostering the exchange of ideas, feedback provision, negotiation of group decisions, as well as evaluation and interpretation of real-life situations (Meletiadou, 2022; Shahid & Khan, 2022). Moreover, digital storytelling enables language students to share decisional practices to achieve collaborative reasoning and story planning (Nicoli et al., 2022). It has also been attested that by narrating virtual stories and presenting their contents to the public, learners can improve their pronunciation skills and transcode communication into visual stimuli (Nair & Yunus, 2021). Consequently, classifications of the types of literacies fostered through digital storytelling can be expanded beyond reading, listening, speaking, and writing; and integrated into a comprehensive development of academic, cognitive, affective, technological, and social skills through highly contextualized social linguistic practices. Examples include reported enhancement of motivation, creativity, participation, and multimodal content production and personalization (Alismail, 2015; Ohler, 2013). Additional interventions showed how the use of digital storytelling can improve students' willingness to enter into L2 discourse by communicating through text modes in technology-mediated language activities (Shen et al., 2022). Studies reported that the use of digital storytelling for language learning purposes can promote authentic vocabulary acquisition, and linguistic production through students' involvement in real-like language learning practices, as well as effective self-assessment through product evaluation and peer feedback (Arroba & Acosta, 2021). Studies have also shown how language structures are acquired when students jointly work on digital storyboarding as they compartmentalize language structures into learnable blocks and discuss story-making stages of setup, conflict resolution, and design challenges (Fu et al., 2022). Therefore, digital storytelling activities can involve students in using multimedia to plan and design artifacts following group choices. Digital stories are also ways for students to reflect on personal experiences while evaluating other people's opinions and creating shared digital imagery (Petit, 2020). Group reflections originating from these collaborative creations facilitate knowledge transfer in communicative and digital real-life contexts. In this process, students engage in mediation strategies aimed at identifying common ground in discussing the creation of digital stories. In doing so, learners devise strategies of social mediation, laying the foundations of collaborative language learning as they rely on one another to accomplish task goals. As for mediation strategies, they can be associated with behaviors of positive interdependence and represent key components of social language learning.

Positive interdependence is a fundamental social behavior as human beings develop contextually-driven, mutually beneficial relationships to attain common goals (Deutsch, 1949). These bonds also induce the establishment of trust, cooperation, constructive power, and conflict resolution amongst group members who collaborate in meaning-making activities and achieve compromises between parties (Johnson & Johnson, 2005; Laal, 2013; Rusbult & Van Lange, 2003). By doing so, individuals share and construct task understanding, target group efforts towards goal achievement by recognising the value of other people's perspectives, and encode messages using social inferences, speakers' feedback, and language output (Ellis, 1999). When applied to language education, these competencies can be fostered through group-oriented, task-based language activities that involve students in constructively solving disagreements for the sake of successful goal attainment. In these activities, individuals can apply social mediation strategies, which are considered manifestations of positive interdependence in their capacity to favour interpersonal connections for social and cognitive development (Comoglio & Cardoso, 1996; Kelley et al., 2003; Johnson & Johnson, 2010). From the standpoint of teaching Italian as a Foreign Language (FL), mediation strategies are considered to manifest in expressing opinions and requesting information through conditional and subjunctive moods, and are taught at pre-intermediate levels of proficiency (Arcangeli et al., 2014; Giorgi, 2009). What remains to be investigated are the task structures supporting positive interdependent relationships and the integration of effective tools in language learning activities for group efficiency and linguistic mediation.

Task-based language learning (TBLL) is a learner-centred methodology focused on enhancing learners' communication skills in real-life contexts. The main tenet of the method is that language is acquired through cooperative interactions that engage students in goal-oriented, meaning-making activities where they learn content and practice language skills through peer communication and artifact use (Hampel, 2010). This entails that students apply cognitive practices to select, classify, order, and value information as they choose

suitable language structures to attain activity goals. Specifically, in an initial pre-task phase, students are provided with activity instructions and tool training before being involved in planning and presenting their work, sharing group reports, and attending to linguistic forms by discussing and practicing specific language features. Since learners mediate messages both linguistically and conceptually, they also assist one another in performing group tasks, thus perceiving the added value of teamwork while performing activity goals. The communication affordances created within such learning contexts constitute the link between TBLL and technology, as methodological implementations of action-oriented language learning approaches are combined with enhanced opportunities for goal attainment (Overdijk et al., 2012). A key element of digital tools is that they act as mediators between individuals and task contents, implying that the successful establishment of interdependent relationships is dependent upon technological affordances of goal attainment facilitation, multi-user access, platform accessibility, and ease of use (Cerratto Pargman et al., 2018; Thorne, 2016). However, even though many investigations have been conducted on digital tools in language education, research on their impact on students' positive interdependence in online-only learning environments within TBLL frameworks is scarce, especially concerning learning Italian as a FL. To address these gaps and provide potential solutions to solve them, it is useful to discuss potential digital tools to boost students' positive interdependence.

Analyzing the use of Virtual Reality for language learning purposes becomes particularly significant when considering its immersive properties. Broadly defined as an "advanced form of human-computer interface that allows the user to interact with and become immersed in a computer-generated environment in a naturalistic fashion" (Eichenberg, 2012, p. 3), Virtual Reality is typologically divided along the parameters of immersion. Described as the technical capability to deliver an illusion of reality that has a profound impact on users' behaviors (Dincelli & Yayla, 2022; Slater & Wilbur, 1997), immersion characterizes immersive Virtual Reality (iVR) as a comprehensive digital experience where virtuality predominates over reality, since it is accessed with head-mounted displays (HMDs) and hand controllers, physically disconnecting users from the real world. Conversely, immersion afforded by non-immersive VR (non-iVR) is only partial, as users rely on screen interfaces to access and experience virtual activities, viewing them on two-dimensional monitors or mobile devices and using peripheral devices to enable device interactions which help to maintain real-world awareness (Kaplan-Rakowski & Gruber, 2019). However, despite its different characteristics, non-iVR is also characterized by educationally-relevant features that boost interdependence in language learning activities. In fact, non-iVR has been analyzed in language education to support virtual work in the form of collaborative virtual environments (CVEs), wherein team members interact in the same digital space while being physically located elsewhere (Horvat et al., 2022). Designed to enhance user collaborations, CVEs contribute to make virtual spaces shared worlds of interpersonal relations and co-constructed relationships (Galimberti et al., 2010). Subsets of CVEs are Virtual Field Experiences (VFEs), that are particularly relevant for language learning as they represent flexible and interactive 360° scenarios embedding audio, video, and multimodal resources (Oguilve et al., 2022). These experiences involve users in virtual explorations through the use of keyboards and other peripheral accessories, enabling interface scrolling, clicking, and dragging as they unpack interactive digital contents. In other words, users are involved in sensorial explorations of visually stimulating spaces where their critical skills are enhanced through collaborative discoveries and meaning-making. In this way, learning through VFEs becomes a form of interdependence-supporting telepresence, where virtual immersion is capitalized on to enhance learning through digital storytelling and boost cognitive and interpersonal skills, as well as group efficiency in achieving task goals (Jantakoon et al., 2019). In other words, motivated by the immersive scenarios they experience, students can engage in co-creative, story-making practices in which they transfer thoughts and emotions and transcode them into language output related to sharing and mediating opinions and decisions (Liu et al., 2018; Ribeiro et al., 2016; Schmoelz, 2018). Given the high pedagogical impact of immersive activities and the immediate applicability of teamwork and digital skills acquired through task completion, there are reasons to believe that virtually immersive digital storytelling activities can support positive interdependence among language students. What needs to be analyzed are examples of tools enabling the creation of customizable and sharable digital stories in the target language.

The popularity of digital storytelling applications has resulted in their implementation in language learning activities that integrated virtual narrations with multimedia components and web publishing technologies, which encouraged students' active learning and collaboration towards content creation (Tahriri, Tous, & MovahedFar, 2017). Types of digital storytelling platforms used in language education include social network (*Whatsapp*, *Instagram*, *Snapchat* and *TikTok*), digital story sites (*Storify, StoryBook, Historypin, Storybird, Animoto, ThingLink*) and mobile-integrated storytelling apps (*izi.Travel, StoryMaps*). One that has

been extensively used for pedagogical purposes is *ThingLink*, an ad-free subscription software enabling the incorporation of 360° photos, sounds, videos and texts that can be incorporated within tours referring to places in the real world (Fielding, 2019; Pokrzycka, 2022). When this study was conducted, the application was free of charge and dedicated to teachers, students and third-sector professionals willing to create interactive tours and presentations for educational purposes. *ThingLink* applications in TBLL have been used to develop students' curiosity, exploration skills and vocabulary learning (Lai, 2017; Roslan & Sahrir, 2020; Compagnoni, 2022) as well as train teachers on integrating *ThingLink* into the school curriculum (Durham, 2022; Sanderson et al., 2022). However, data is missing on the potential uses of *ThingLink* to enhance positive interdependence in a foreign language learning context. Whilst this might be due to technological constraints limiting multi-user content editing, it is also true that the application features might hinder users' platform navigation and readability. A digital storytelling platform whose features might overcome such constraints is *StoryMaps*, which enables users to create engaging and interactive digital stories. Due to its user-friendly design and content customizability, the platform has been used to enhance students' agency, content understanding, and memorization through hands-on group activities (Albanese & Rossetti, 2023; Cyvin et al., 2022). However, no evidence has been found of interventions conducted in language pedagogy with *StoryMaps* to boost students' positive interdependence. Despite the paucity of research on using *ThingLink* and *StoryMaps* in language pedagogy, it is believed that when incorporated into classroom activities, they might shed light on students' positive interdependent strategies in FL production.

Overall, while the literature on cooperative learning has been quite prolific, it has failed to consider positive interdependence as a pivotal component of cooperation. Additionally, deficiency of research/research gap on positive interdependence in language learning have also led to a lack of guidelines on classroom implementations of effective digital tools and methodologies supporting explorative, engaging, and immersive language learning activities. To target these gaps, this study outlines language activities fostering interdependence through FL use. Specifically, by considering VFEs and digital storytelling features embedded in *ThingLink* and *StoryMaps* as forms of non-iVR, this study involved learners of Italian as a FL in interactive digital storytelling activities through web-based explorations and critical assessments of culturally relevant scenarios. Results of online interventions were analyzed through classroom observations, questionnaires, and focus group interviews, as well as through descriptions of the linguistic interactions occurring during the creation of digital stories.

3. Methodology

An experiential intervention was structured according to a task-based methodology comprising participants' exposure to the non-iVR platform *ThingLink*, a task phase of story creation on *StoryMaps*, and post-activity reflections on the use of non-iVR. The study targeted the analysis of the impact of non-iVR-based digital storytelling on the deployment of positive interdependence strategies by FL learners. Aspects of performance and perception by collecting textual and spoken data documenting participants' cooperative interactions as well as their responses to pre and post-task questionnaires and a focus group interview. In this paper, the term "interventions" is synonymous with the language learning sessions conducted with the use of the non-iVR platforms *ThingLink* and *StoryMaps* to enquire about participants' deployment of positive interdependence strategies.

3.1. Participants

Data was collected from 13 participants aged between 23 and 65 years old. The majority possessed an intermediate language proficiency in Italian, a language they were studying for personal and professional interests. Some participants were working in Italy (5), others were pursuing an academic degree in an Italian institution (8). French was the native language spoken by the majority of participants (7), followed by Spanish (3), Russian (2), and German (1). All participants were fluent English speakers and had been exposed to VFEs through museum galleries and property tours.

3.2. Recruitment methods

Participants were recruited voluntarily from students affiliated with the School of International Education of Ca' Foscari University of Venice and the Department of Social, Political, and Cognitive Sciences of the University of Siena. Following positive replies to email invitations, a pre-activity questionnaire was distributed to participants one month before the start of the interventions. The aim was to enquire about

participants' knowledge of Italian culture, grammar features related to subjunctive and conditional moods, and their motivation to study Italian. Additional questions consisted of investigating participants' digital habits, experience with online learning, remote teamwork, and VFEs. The responses obtained from this preliminary investigation enabled the researcher to tailor activity contents to students' needs and abilities.

3.3. Class conduction

The interventions lasted a total of 12 hours and were conducted twice a week for 2 hours at a time on the platform *Zoom* in November 2022. Before participating in the sessions, participants were requested to sign a consent form outlining the research aims, data collection, and storage methods as well as privacy protection procedures. Upon returning the signed consent forms, participants were sent invitations to join *Zoom* classes which were recorded from an institutional account. Participants were encouraged to keep their videos and microphones on. In the first part of the *Zoom* sessions, participants worked together before being divided into breakout rooms. In these breakout rooms, they conducted group explorations of 360° environments on the platform *ThingLink*, working on interactive tags with language content aimed at enhancing their familiarity with the structural parameters of digital storytelling. Subsequently, they used *StoryMaps* for story creation and *Padlet* to provide peer feedback (Figure 1).
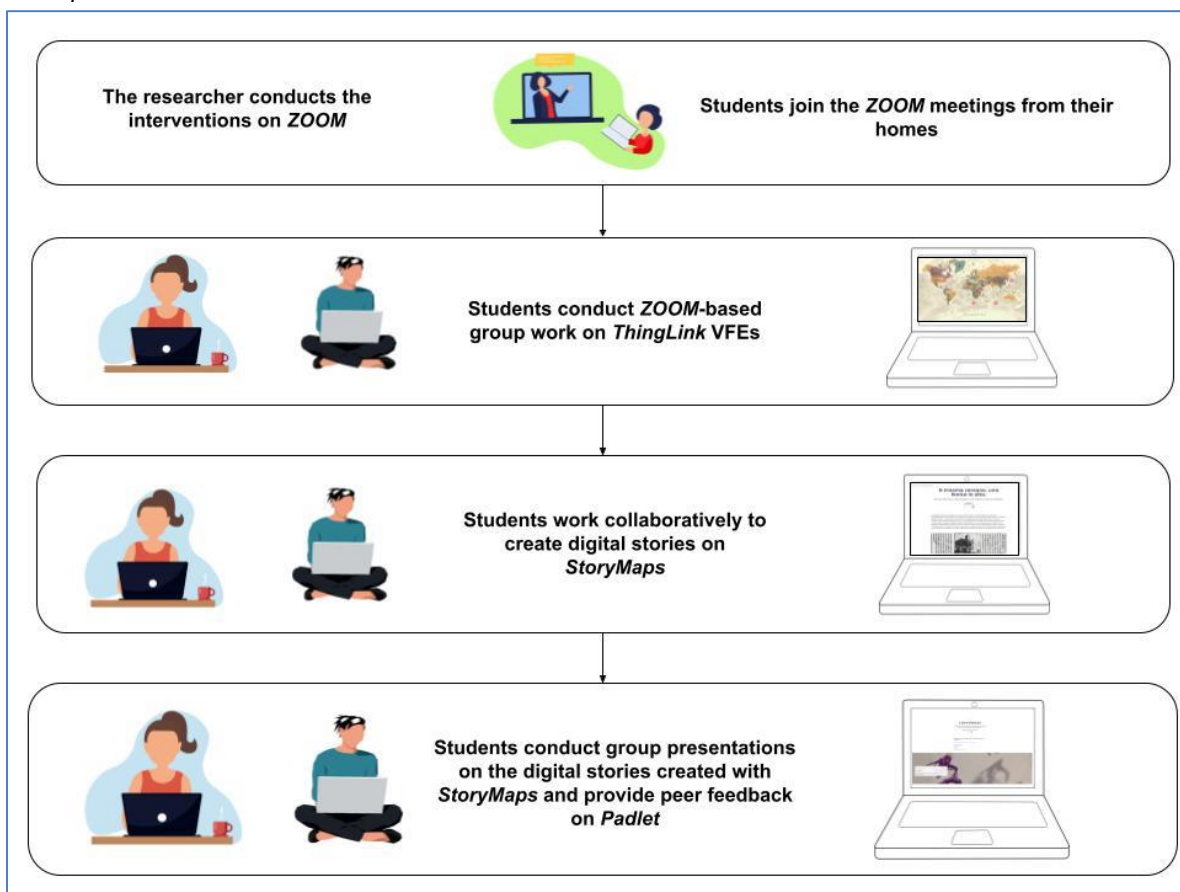

Figure 1. Activity sequence conducted during the interventions

3.4. Activity structure

Study participants were involved in tasks distributed across the duration of the online language course. Table 1 outlines activity contents and the platforms used to attain task goals.

Table 1
Task-based structure of the interventions

Phases	Description	Platforms
	Pre-task	
	Completion of a pre-task questionnaire.	*Kahoot!, ThingLink,*
	Brainstorming 1: training on using *ThingLink* to conduct explorations of VFEs.	*StoryMaps, Google Drive*
	Brainstorming 2: grammar review of conditional and subjunctive moods and gamified practice on *Kahoot!*	
	Brainstorming 3: training on using *StoryMaps* through the exploration of digital stories.	
	Task cycle	
1. Task	Students discuss and select story topics. They write content, finalize and publish their stories.	*StoryMaps, Google Drive*
2. Planning	Students plan and rehearse their group presentations.	
3. Report	Students conduct group presentations of their stories.	
	Post-task	
1. Analysis	As group presentations unfold, non-group members provide their feedback on designated *Padlet* boxes while listening to the presentations. Subsequently, participants are guided in the analysis of subjunctive and conditional forms used during the interactions.	*Padlet, Google Drive, Google Modules*
2. Practice	Students practice subjunctive and conditional moods during focus group interviews. They also respond to a survey consisting of qualitative (open-ended) and quantitative (Likert-scale) questions.	
	Completion of a post-task questionnaire and a focus group interview.	

3.5. Design checklist

The creation of interdependence-fostering language learning experiences on *ThingLink* was underpinned by structural as well as linguistic considerations resulting from the VFEs design checklist outlined by Oguilve et al. (2022) and adapted to the study aims (Table 2).

Table 2
Design checklist for creating interdependence-fostering VFEs on ThingLink.

Goals	Icons	Media
What are the goals of the experience? How are they clarified to students?	Are icons clear and consistent? Are they coherently distributed within the exploratory space?	Do resources and media represent reliable and multiple perspectives? Do they affect the learning experience? Are there the right amount of content to explore?
Language Content	**Organization**	**Group Engagement**
Do the activities encourage users to deploy interdependence-oriented language output?	Would learners know where to start and how to engage with the materials? Does content organization promote understanding?	Do activities promote group exploration and engagement? How are learners involved in collaborative goal attainment?

3.6. Activity contents

During the first two classes, the participants conducted two *ThingLink*-based activities where they explored interactive maps. Both experiences contained virtual tags with links to *Google Drive* documents and surveys created with *Google Modules*. Activities included listening to recordings and answering related questions, as well as completing short reading comprehension activities. The participants explored the environments by working in *Zoom* breakout rooms in four groups, which remained the same throughout the

course. After brainstorming potential topics, participants discussed story contents and engaged in spoken and written production of Italian. Examples of *ThingLink* VFEs and the digital stories created on *StoryMaps* are shown in Figures 2 and 3. The arrows in Figure 2 indicate the transitions between different *ThingLink* environments while the pictures in Figure 3 represent three stories created with *StoryMaps*.

Figure 2. VFEs conducted with the platform ThingLink.

Figure 3. Screenshots of three digital stories created on StoryMaps.

3.7. Data collection methods

Data was collected via a mixed-method design combining pre- and post-task questionnaires, class observations, and focus group interviews. Two weeks before starting the activities, a pre-task questionnaire was distributed via email to the participants. It consisted of 39 items on participants' demographic information, knowledge of Italian culture and grammar as well as conditional and subjunctive moods, tested through gap-filling exercises. Further questions collected information on technology use and habits, digital skills, and online learning, as well as previous exposure to VFEs and participants' beliefs on using immersive tools for language learning. Aspects of positive interdependence were identified by using 13 parameters of the SYMLOG model of Bales (1950) to analyze group interactions.

Table 3
List of parameters for analyzing interdependent group interactions based on Bales' SYMLOG model (1950).

Manifestations of positive interdependence
Providing information to others
Accepting help from others and giving thanks
Minimization of disagreement
Collaborative work
Participation in decision-making
Showing and stating understanding through verbal and body language
Requesting information
Asking for opinions and suggestions
Display of group dedication, faithfulness, and loyalty
Giving up personal aspirations for the sake of group goals
Controlling/limiting the abilities of other people to express opinions
Inviting other people to intervene
Seeking feedback

The 13 parameters listed in Table 3 were selected because they facilitated an initial overview of the potential interdependent behaviors surfacing among study participants. Following this initial analysis, participants' verbal interactions were transcribed with the software *Nvivo* and analyzed to record manifestations of positive interdependence surfacing as mediation strategies. Positive interdependent output was analyzed using the 13 parameters of Bales' SYMLOG model (1950) outlined in Table 3. Subsequently, the guidelines of the Council of Europe (2020) were followed to map participants' positive interdependent strategies and group them according to the parameters they belonged to. The guidelines that were followed corresponded to those cited on the Common European Framework of Reference for Languages (CEFR) of the Council of Europe (2020). They are outlined in Table 4.

Table 4
Parameters used to analyze positive interdependence amongst the participants' linguistic and behavioral output.

Parameters of positive interdependence as mediation strategies		
	Establishing conditions	Developing ideas
Collaborating in groups	Facilitating collaborative interactions	Collaborating to construct meanings
	• Comprehension and signaling of misunderstandings, offer solutions to address them	• Give instructions
	• Adjustment of questions and intervention in group interactions	• Check group understanding
	• Help addressing delicate situations	• Refocus conversations on topics that matter
	• Define team goals and compare options on how to achieve them	• Intervene supportively to focus group attention
	• Refocus conversations suggesting ways to proceed	• Explain the rules of collaborative discussion
		• Get the group back on track with new instructions
		• Encourage participation and balance contributions with turn-taking

	• Discourage disagreements and propose alternatives	
Leading group work	Managing interactions	Encouraging conceptual talk
	• Expand people ideas and contributions	• Ask questions simulating logical reasoning
	• Pose questions that invite reactions	• Encourage members to elaborate their thinking
	• Consider pro and cons and both sides of an issue	• Build on ideas
	• Highlight important issues in a task and steps to solve it	• Give appropriate feedback to help conversations going
	• Contribute to collaborative decision-making and co-develop ideas	
	• Summarize and report what others have said	

Data collection was corroborated by the completion of a post-task questionnaire aiming at collecting information on participants' enjoyment as well as collaboration, language practice, sense of presence, perceived usability, and usefulness of VFEs and *StoryMaps* to attain activity goals. The latter parameters were measured with a scale of 41 items in a seven-point Likert scale format (Witmer & Singer, 1998). Additional parameters related to user comfort were collected using the Simulator Sickness Questionnaire (SSQ) elaborated by Kennedy et al. (1993). Completing these questions allowed participants to self-assess their learning process while using *ThingLink* VFEs and *StoryMaps*. Lastly, a focus group interview was conducted to collect information on whether using the two applications facilitated the emergence of positive interdependence amongst study participants. Information was collected through individual answers to verbal questions and written feedback following group discussions.

4. Analysis
The analysis unfolds from a mixed-methods inquiry on qualitative data collected from behavioral observations, open-ended questions, and focus group interviews as well as quantitative information arising from pre- and post-task surveys. Observations of students' interactions and a content analysis of transcriptions revealed composite positive interdependent interactions unfolding from task stages. Concerning the pre-task questionnaire, relevant data emerged from technological competence, language proficiency, and motivation. In terms of tech-savviness, Figure 4 shows that majority of participants rated their competence as advanced (69.2%) and stated they used phones and computers between 2 and 8 hours a day. They were also confident in their ability to create digital materials and navigate computer functions and did not rate the difficulty of using conditionals and subjunctives as high, despite low performances in subjunctive forms.
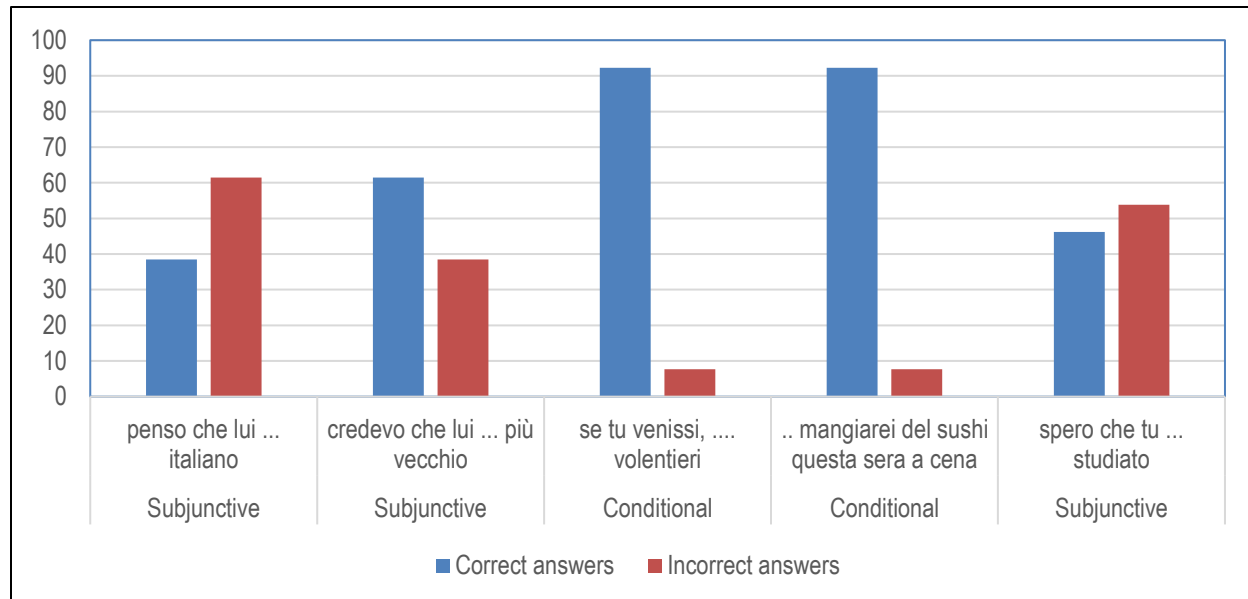
Figure 4. Participants' scores in answering questions on the use of conditional and subjunctives. The sentences they had to complete are listed in the x-axis while the y-axis displays the percentages of successful performance.

As for the post-activity questionnaire, significant data arose in terms of types of positive interdependence developed amongst students concerning skill transferability and descriptions of likes and dislikes of the immersive experiences they conducted. Figure 5 shows that, in terms of perceptions of transferability of the learned skills, judgments were expressed as very low (VL), low (L), high (H), or very high (VH). On the other hand, Table 5 displays participants' answers to the two qualitative questions embedded in the online questionnaire, consisting of "What did you like the most about these experiences?" and "What did you like the least about these experiences?".
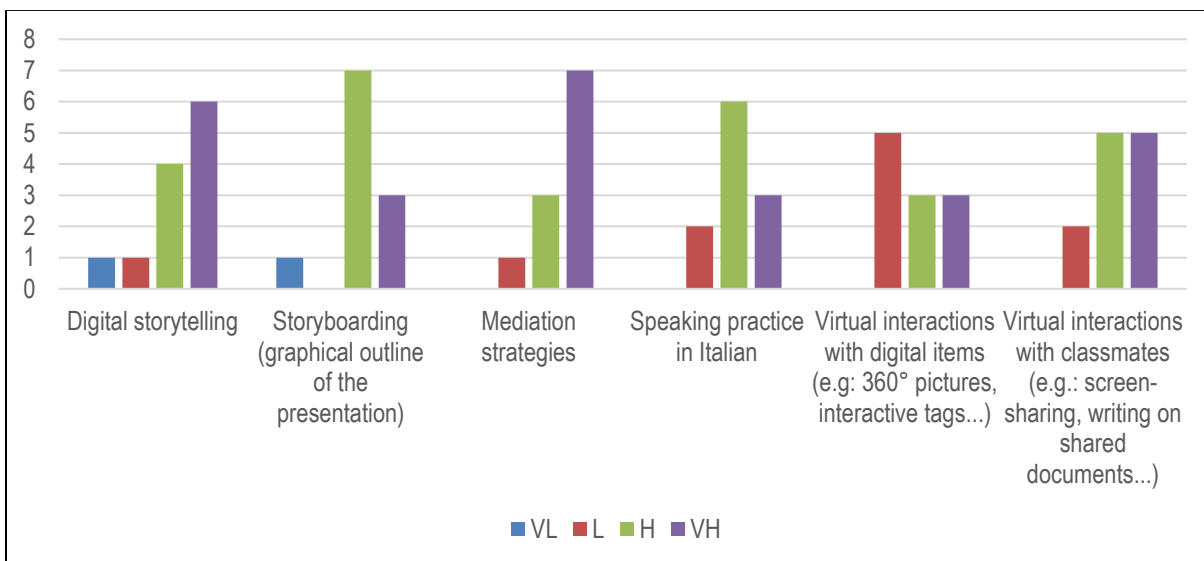
Figure 5. Judgements expressed in the post-task questionnaire by the participants in relation to the question "How would you rate the applicability of each skill to your professional and social life?"

Table 5
Selection of participants' answers to the questions

"What did you like the most about these experiences?" - Likes about the immersive experiences	"What did you like the least about these experiences?" - Dislikes about the immersive experiences
a. The opportunity to speak Italian, and exchange some ideas with people from all over Europe.	e. The time was very limited, and it was not clear from the beginning that additional time would be needed.
b. The interactivity of the platforms and sharing or bouncing ideas with classmates. Exploring an Italian city (Siena), its culture and art, and performing tasks on a virtual map, I really liked this experience since I felt it was like a game, a quest.	f. It can be a little bit complicated to work in groups when it has to be on a platform (for example: *StoryMaps*, just one person had access to the map of the group so it restricts the opportunity to completely use this platform). Maybe, some work should be done individually.
c. The fact that there was no time for being bored. It was very interactive, and the fact that we often were in breakout rooms gave us autonomy. I think this is the key when you are online. Also, the repartition of activities during the 12 hours was very well done.	g. Documents downloading, creating new accounts.
d. It was very practical and real. We were introduced to a new way of learning the language which I found very interesting and motivating.	h. Maybe I would have liked to improve my Italian grammar.

When asked to rate in the questionnaire whether the digital stories created on *StoryMaps* were the results of joint group decisions, 72.7% of the participants replied it was evenly spread between group members. Focusing on the creative story process, most participants positively rated the easiness of reaching agreements using *StoryMaps*, stating they were facilitated to use as it enabled them to hear each other's opinions, share ideas, and understand content.

Table 6
Participants' responses to the post-task survey question: "Do you feel that the digital story created by your group on StoryMaps is more the result of your decisions, your partners' decisions, or both?"

Parameters	Results
More mine	9.1%
My partner's	18.2%
Both	72.7%

To obtain further information related to the emergence of positive interdependence as mediation strategies, a content analysis was conducted on participants' transcriptions using the parameters of Table 4. Resulting patterns of positive interdependence were grouped into five main areas: instruction provision, collaborative meaning-making, clarification seeking, participation encouragement, and language negotiation. Unabridged transcripts from participants' verbal interactions have been provided in Table 7 together with their English translations.

Table 7
Examples of positive interdependence surfacing from participants' interactions in creating content on StoryMaps and discussing the interpretation of a piece of art present in the VFEs experiences.

a. Instruction provision and mediation of language use	
S1: Melancolico con la "e".	S1:(while writing story contents on StoryMaps) Melancolico with an "e".
S2: Dove la "i"? Non è "milancolico"?	S2: Where the "e"? Isn't it "milanconico"?
S1: No è con la "e" e poi la "n".	S1: No it is with "e" and then "n".
S2: Ah ok.	S2: Ah ok.

S1: Come scrive, così? Guardate se sto scrivendo giusto. "Ha una intenzione per attrarre la gente…".	*S1: How do you write it, like this? (In the shared screen, she hovers over the word she has just written). Check if I am writing it correctly. (Starts reading out loud what she has written in Italian) "Ha una intenzione per attrarre la gente…".*
S2: Ha intenzione di attrarre la gente a Siena. Attrarre con due "r".	*S2: (Corrects a missed "r" in the verb "attrarre" emphasizing the "r") He has the intention to attract people to Siena. "Attrarre" with two "r".*
S1: Così? S2: Sì.	*S1: Like this?* *S2: Yes.*

b. Meaning-making, clarification seeking, participation encouragement	
S3: L'artista? Se faccio un errore ditemo, perché non scrivo bene in italiano…	*S3: (While examining a sculpture in the ThingLink VFE) The artist you mean? If I make a mistake please let me know because I do not write well in Italian (Shares her screen as she is typing in the document)*
S4: Tranquilla!	*S4: Don't worry!*
S3: Ok, io penso che la nubilità è una forma di intimità? Intimità…intimità…Tipo, la donna perché dà l'impressione a chi guarda di essere nella vita della donna. Non so se è chiaro?	*S3: Ok, I think nudity is a form of intimacy? Intimacy…intimacy... (The participant pauses as she looks for the word) For instance, the woman because she gives the impression to the onlooker to be in the life of the woman. I am not sure if I am clear.*
S4: Può essere che sta esprimendo qualcosa per l'artista, non lo so, ora cerco. Che cosa ne pensi?	*S4: It could be that she is expressing something for the artist, I don't know, I am looking for it. What do you think?*
S3: Penso che un pittore voleva imparare a disegnare il corpo, il corpo della donna, il corpo dell'uomo. Questo era necessario per essere raffigurato nuda e per sapere, per imparare come disegnare il corpo.	*S3: I think that a painter wanted to learn how to draw the body, the body of the woman, the body of the man. This was necessary to be represented naked and to know, to learn how to draw the body.*
S4: Si io penso che questa donna si chiama Siena perché la città si chiama Siena e ha una storia… ha una storia nel fondo può essere il letteratura. Non lo so. O di arte non lo so. Ma si è l'autore di questo e sta facendo un'arte con questa nubilità.	*S4: Yes, I think this woman is called Siena because the city is called Siena and it has a history….it has a history deep within and it could be literature. I don't know. Or of art, I don't know. But yes, the author is making art with this nudity.*
S3: Non so cosa vuoi dire quando dici "fare un arte" …cosa vuoi dure quando dici "l'artista sta facendo un'arte con la nubilità?"	*S3: I don't get what you mean when you say «making art»…what do you mean when you say "the artist is making an artwork with nudity"?*

Data from focus group interviews revealed further information in terms of the positive interdependence emerging between participants during the activities. As the participants preferred to conduct the interviews in Italian, English translations have been provided together with the original transcripts.

Table 8
Selection of participants' answers to focus group questions targeted at understanding the deployment of positive interdependence during non-iVR activities.

Transcribed and translated extracts from focus group interviews	
a. Penso che la cosa che mi è piaciuto di più è forse che tutte noi abbiamo contribuito a raccontare storie al meglio di come potevamo.	*a. I think the thing I liked the most was that we all contributed to telling stories to the best of our abilities.*
b. Tutte noi tre parlavamo ed esprimevano le idee. Nessuna stava a dire niente. Erano tutte attive per proporre idee e suggestioni.	*b. All three of us talked and expressed ideas. Nobody stood there and said nothing. We were all active in proposing ideas and suggestions.*
c. Sì penso che il più importante nel nostro gruppo è di dare idee e di anche ascoltare le idee dell'altra per poter fare un bel lavoro.	*c. I think the most important thing in our group was to propose ideas and also listen to other people's ideas to do a good job.*

d. Abbiamo collaborato e preso delle decisioni in gruppo per organizzarsi a pensarci. Penso che abbiamo preso soggetti che ci piacevano quindi era facile da condividere.	*d. We collaborated and made group decisions to organize ourselves in our thinking process. I think we all decided on topics we liked and that made it easy to share [ideas].*

Further information on group management was collected through answers to the questions on the group activities conducted during the focus group interviews, as participants described the strategies of positive interdependence they deployed during the non-iVR activities (Table 9). Written contents were provided in their unabridged version, together with their corresponding translations.

Table 9
Written information provided by the participants in response to the question "How did you manage the organization of group work during the activities you have conducted? Discuss this in your groups and write down the content of your decisions".

Participants' feedback on group management	
a. Prima di tutto abbiamo ascoltato / sentito quello che l'atra persona voleva compartire così avevamo un scambio de idee. Abbiamo anche parlato molto, quindi la comunicazione ha stato il mezzo più importante per costruire le idee e il progetto. Abbiamo avuto una considerazione reciproca per aiutarci durante la attività. Abbiamo condiviso la nostra conoscenza e abbiamo abbracciato le idee che scambiavamo. Anche abbiamo fatto un scambio di email e *whatsapp* costantemente per comunicare.	*a. First of all, we listened to what the other person wanted to share so that we could exchange ideas. We talked a lot, so communication was the most important tool to construct ideas and design the project. We considered each other to help us during the activities. We shared our knowledge and [positively] received the ideas we shared. We have also had a constant exchange of emails and [messages on] WhatsApp to communicate.*
b. Eravamo velocissime, attive e abbiamo espreso facilmente le idee. Abbiamo collaborato e preso delle decisioni in grupo. Abbiamo dato delle idee pero anche abbiamo ascoltato e accetato le idee degli altri. Ci siamo organizzati e siccome ci piaceva la tema e stato facile di dividersi i ruoli.	*b. We were fast and active and we easily expressed our ideas. We have collaborated and made group decisions. We have also given ideas as well as listened to and accepted the ideas of others. We organized ourselves and since we liked the topic it was easy to divide roles between each other.*
c. Tuuti eravano interesante per questa attività, ma alle fine abbiamo scelto quelli che sembravano per noi più interesante. Dopo abbiamo visto che un po dificile metere in sieme il lavoro di tutte. Ma con aiuta di whatsapp ci abbiamo organizato meglio.	*c. We were all interested in this activity but in the end we picked those [topics] that seemed more interesting to us. Afterward, we noticed that it was a bit difficult to combine the work of all of us. However, with the help of WhatsApp, we better organized ourselves.*
d. Abbiamo fatto un buono lavoro, abbiamo organizzato tutto in un modo semplice ed efficiente. Abbiamo ascoltato ciascuna opinione di ognuno. Non avevamo ruoli, ma ci siamo capiti bene alla fine e tutti hanno parlato, scritto, letto e dato le sue informazione sul cibo, perché a tutti piace il cibo.	*d. We did a good job, we organized everything simply and efficiently. We listened to the opinions of each other. We did not have roles but we understood each other well in the end and everyone has spoken, written, read, and provided their information on food because we all like food.*

5. Discussion

In discussing positive interdependence arising from students' interactions in non-iVR, it is important to consider its impact on behavioral aspects resulting from interactions with technology. In terms of the latter parameter, a preliminary analysis of positive interdependent behaviors revealed high rates in participants' proficiency with technology, which is likely to have facilitated interaction flow as participants directed their actions towards goal achievement while intuitively navigating the platforms. It is also possible that the combination of technological savviness, linguistic competence, and immersion favored by the non-iVR platforms *ThingLink* and *StoryMaps* encouraged participants to select mediation strategies as the most transferrable skills acquired during group interactions and perceive the digital stories created by their groups as the product of collaborations (Table 6). In terms of the latter parameter, potential failures in acknowledging partners' contributions might signify that positive interdependence did not manifest between participants. This could be due to the inability of participants to simultaneously work on the digital stories published on *StoryMaps*, which prevented them from exercising shared agency of the final project and flawlessly conducting

group work (Table 5, f). Despite these results, the positive aspects of the conduction of group work outweighed the negatives as participants praised application interactivity, autonomy in directing group work towards sharing ideas, as well as the ability to speak Italian whilst talking to people from other linguistic and cultural backgrounds (Table 5, a, b, c, d). Participants also stated to have been collaboratively involved in the activities by working on application contents while taking part in gamified quests (Table 5, b). Moreover, transcripts from the participants' focus groups showed that they identified the ability to attentively listen to contributions from other participants as a key element of group success (Table 8, c). In particular, they claimed to have provided creative contributions to the best of their abilities and mediated their ideas with the rest of the group (Table 8, d). This highlighted the deployment of positive interdependence, which participants further enhanced by meeting outside of classroom hours to organize and complete their story projects. These communication strategies facilitated participants in attaining task goals and reaching optimal levels of positive interdependence (Table 8, a, b, d, Table 9, a, b, c, d).

The results obtained from analyzing survey responses were further confirmed by transcript analysis, which revealed the appearance of positive interdependence in the form of mediation strategies as users facilitated cooperative interactions, collaborated in language-based meaning-making, and encouraged conceptual talk (Table 7). Specifically, interdependence surfaced as individuals summarized group decisions and added their contributions to ideas proposed by group members. By doing so, they directed group decisions toward goal attainment and engaged in seeking partners' clarifications as they monitored each other's written production in creating virtual content (Table 7, b). Moreover, participants supervised the creation of written input, thus covering positions of leadership whilst allowing for other members' creative input to surface (Table 7, a). Furthermore, content interactivity and exploration favored collaboration through the exchange of ideas and stimulated spatial group exploration. In terms of experiential downsides, participants complained about the lack of focus on grammar in favor of group activities of content creation (Table 5, h). Digital storytelling appeared to offset some of the downsides of prolonged tech exposure including the distribution of information load across participants, which reduced distraction and disengagement from group activities. Moreover, curiosity was enhanced by the explorative possibilities afforded by the applications *ThingLink* and *StoryMaps* which contributed to engaging the participants in taslk-oriented language production. The immersion afforded by interacting with the platforms also stimulated creativity and favored role division and cooperation in goal attainment. This appeared to favor the co-construction of interdependent relationships in immersive virtual spaces, as cited by Galimberti et al. (2010). The joint use of digital storytelling and non-iVR also appeared to involve users in highly cooperative activities as they mediated decisions and effectively reached task objectives, hence confirming what was stated in the literature in terms of the benefits of digital storytelling for cooperative group activities (Ribeiro, Moreria & da Silva, 2016; Liu et al., 2018; Schmoelz, 2018). However, downsides were noted in participants' tendencies to download materials from digital repositories unincorporated in the targeted digital applications, which slowed down group performance (Table 5, g). Participants also stated that limited time availability and instructional clarity were detrimental to activity completion (Table 5, a).

Despite the relevance of the data obtained during the interventions, the number of participants in this study was rather small. Therefore, further investigations could include a wider population sample sourced from schools and academic institutions. From a technical perspective, the seamless integration of cloud units into immersive digital platforms might facilitate group participation and minimize efforts of platform management. Therefore, in integrating immersive technologies into language education practices of positive interdependence, it is important to consider technological affordances facilitating the sharing of opinions and ideas as well as multi-user manipulations of digital materials, collaborative meaning-making, and goal orientation in the target language. Despite these limitations, this discussion highlighted the importance of interdependence-supporting inquiries and the role of immersive technologies in encouraging students' linguistic and social competencies in light of their transferability to real-world situations. With regards to declinations of positive interdependence in task-based communication, particular focus could be placed on strengthening students' mediation strategies in the target language whilst cooperating in digital product creation. These pedagogical implications could also be included in methodological reflections on teacher training related to the use of non-iVR technologies in language learning settings. Particular focus might be placed on evaluating teachers' experiences with immersive technologies in terms of acceptance, perceived usability, and ease of use. Providing the conduction of preliminary assessments of teachers' and students' needs in their educational contexts, investigations of this kind are deemed to be of pivotal importance in providing teachers with guidelines on how to use non-iVR tools to encourage language learning through digital social practices. Further inquiries could also focus on whether language students involved in iVR activities may boost

positive interdependence by cooperatively working on the creation of digital products within immersive virtual environments.

6. Conclusion

The study provided an initial overview of the current literature on digital storytelling and immersive technologies as well as their implications for language education. Considerations on cooperative learning and task-based methodologies were drawn to highlight gaps in the literature on investigating ways to boost students' positive interdependence in digital language learning contexts. In fact, with the increasing implementation of virtual technologies in social and professional contexts, focusing on students' positive interdependence can make students better FL communicators and collaborators. Data surfaced from combinations of behavioral observations and content analysis of participants' transcripts and survey answers. By conducting interactive language learning activities in non-iVR environments, participants engaged in meaning-making, valued personal contributions to goal attainment, and monitored each other's target language production. Despite lacking time and the possibility to simultaneously edit digital content, participants successfully interdepended by collaboratively exploring VFEs on *ThingLink* and planning and creating digital stories on *StoryMaps*. Moreover, the joint use of digital storytelling and non-iVR platforms appeared to reduce potentially negative effects related to technology overexposure such as distraction and activity disengagement due to platform interactivity and immersive participation. This demonstrated the successful impact of non-iVR in fostering language students' positive interdependence, and highlighted the necessity of further investigations in the use of immersive technologies enabling the deployment of collaborative skills transferrable to digital and real-life settings of professional and social nature.

References

Albanese, Valentina E., & Rossetti, Giulia (2023). The Irish Colonial Landscape Digital StoryMap: An inclusive didactic tool. *J-READING Journal of Research and Didactics in Geography*, *1*(12), 145-153. https://doi.org/10.4458/5970-12

Alismail, Halah A. (2015). Integrate digital storytelling in education. *Journal of Education and Practice*, *6*(9), 126–129.

Arcangeli, Massimo, Giugni, Silvia, Cardillo, Giammarco, D'Angelo, Katia, Ferrari, Stefania, Greco, Nuria, & Lucatorto, Angela (2014). *Attestato ADA: Società Dante Alighieri [Certificate ADA: Dante Alighieri Society],* Alma Edizioni.

Arroba, Juan, & Acosta, Hazel (2021). Authentic digital storytelling as an alternative teaching strategy to develop speaking skills in EFL Classes. *LEARN Journal: Language Education and Acquisition Research Network, 14*(1), 317–343.

Bales, Robert F. (1950). *Interaction process analysis; a method for the study of small groups* (pp. xi, 203). Addison-Wesley.

Cerratto Pargman, Teresa, Nouri, Jalal, & Milrad, Marcelo (2018). Taking an instrumental genesis lens: New insights into collaborative mobile learning. *British Journal of Educational Technology. 49*(2), 219-234. https://doi.org/10.1111/bjet.12585

Comoglio, Mario, & Cardoso, Miguel A. (1996). *Insegnare ed apprendere in gruppo: Il Cooperative Learning [Teaching and Learning in Groups: Cooperative Learning].* LAS.

Compagnoni, Ilaria (2022). The effects of virtual museums on students' positive interdependence in learning Italian as a foreign language. *Babylonia Journal of Language Education, 3*, 104–109. https://doi.org/10.55393/babylonia.v3i.194

Council of Europe (2020). *Common European framework of reference for languages: Learning, teaching, assessment. Companion volume*. Council of Europe Publishing, Strasbourg. Retrieved from https://www.coe.int/en/web/common-european-framework-reference-languages

Cummings, James J., & Bailenson, Jeremy N. (2016). How immersive is enough? A Meta-Analysis of the effect of immersive technology on user presence. *Media Psychology, 19*(2), 272–309. https://doi.org/10.1080/15213269.2015.1015740

Cyvin, Jakob B., Midtaune, Kristiane, & Rød, Jan K. (2022). Using StoryMaps to prepare for field course – A case study of students in Geography. *Cogent Education*, *9*(1). https://doi.org/10.1080/2331186X.2022.2123583

Deutsch, M. (1949). A theory of cooperation and competition. *Human Relations, 2*, 129-152.

Dincelli, Ersin, & Yayla, Alper (2022). Immersive virtual reality in the age of the Metaverse: A hybrid-narrative review based on the technology affordance perspective. *The Journal of Strategic Information Systems, 31*(2). https://doi.org/10.1016/j.jsis.2022.101717

Durham, Carmen (2022). 'We just learned from each other': ESOL pre-service teachers learning to use digital tools across coursework and student teaching. *The Language Learning Journal*, *51*(6), 783–796. https://doi.org/10.1080/09571736.2022.2081713

Eichenberg, Christiane (2012). *Virtual reality in psychological, medical, and pedagogical applications*. IntechOpen, 2012.

Ellis, Rod (1999). *Learning a Second Language through Interaction*. John Benjamin Publishing Company 2012.

Fielding, Sarah (2019). What I did on my holidays: Digital field trips and digital literacy (pp. 77-83). In Plutino, Alessia, Borthwick, Kate, & Corradini Erika (Eds.), *New educational landscapes: Innovative perspectives in language learning and technology* (pp. 77-83). Voillans, France: Research-publishing.net. http://dx.doi.org/10.14705/rpnet.2019.36.9782490057481

Fu, Jo S., Yang, Shih-Hisien, & Yeh, Hui-Chin (2022). Exploring the impacts of digital storytelling on English as a foreign language learners' speaking competence. *Journal of Research on Technology in Education, 54*(5), 679–694. https://doi.org/10.1080/15391523.2021.1911008

Galimberti, Carlo, Brivio, Eleonora, Cantamesse, Matteo, and & Cilento Ibarra, Francesca (2010). Intersubjectivity as a possible way to inhabit future cyberplaces. *Studies in Health Technology and Informatics, 154* (9), 9–13.

Giorgi, Alessandra (2009). Toward a syntax of the subjunctive mood. *Lingua, 119*(12), 1837–1858. https://doi.org/10.1016/j.lingua.2008.11.008

Hampel, Regine (2010). Task design for a virtual learning environment in a distance language course. In Thomas, Micheal & Reinders, Hayo (Eds.), *Task-based language learning and teaching with technology* (pp. 63-81). Continuum Publishing Group.

Horvat, Nikola, Brnčić, Mladen, Perišić, Marija M., Martinec, Tomislav, Bojčetić, Nenad, & Škec, Stanko (2022). Design reviews in immersive and non-immersive collaborative virtual environments: Comparing verbal communication structures. *Proceedings of the Design Society, 2*, 211–220. https://doi.org/10.1017/pds.2022.23

Jantakoon, Thada, Wannapiroon, Panita, & Nilsook, Prachyanun (2019). Virtual immersive learning environments (VILEs) based on digital storytelling to enhance deeper learning for undergraduate students. *Higher Education Studies, 9*(1), 144–150.

Johnson, David W., &. Johnson, Roger T. (2005). New developments in social interdependence theory. *Gender, Social, and General Psychology Monographs 131*(4), 285-358. https://doi.org/10.3200/MONO.131.4.285-358.

Johnson, David W., &. Johnson, Roger T. (2010). Restorative conflict in schools: Necessary roles of cooperative learning and constructive conflict. In Sellman, Edward, Cremin, Hillary & McClusky, Gillean [Eds.], *Restorative approaches to conflict in schools* (pp. 159-174). ESRC Seminar.

Kalantzis, Mary, & Cope, Bill (2012). *Literacies*. Cambridge University Press. https://doi.org/10.1017/CBO9781139196581

Kaplan-Rakowski, Regina, & Gruber, Alice (2019). Low-immersion versus High-immersion virtual reality: Definitions, classification, and examples with a foreign language focus. *Proceedings of the Innovation in Language Learning International Conference, 1.* Retrieved from: https://www.semanticscholar.org/paper/Low-Immersion-versus-High-Immersion-Virtual-and-a-Kaplan-Rakowski-Gruber/0ee4dbaa8c4f8e4a90a12e9cdbeb50b56ac2d83f

Kelley Harold H., Holmes, John G., Kerr, Norbert L., Reis, Harry T., Rusbult Caryl E., & Van Lange, Paul A. M. (2003). *An atlas of interpersonal situations*. Cambridge University Press.

Kennedy, Robert S., Lane, Norman E., Berbaum, Kevin S., & Lilienthal, Michael G. (1993). Simulator Sickness Questionnaire: An enhanced method for quantifying simulator sickness. *The International Journal of Aviation Psychology, 3*(3), 203–220. https://doi.org/10.1207/s15327108ijap0303_3

Laal, Marjan (2013). Positive interdependence in collaborative learning. *Procedia - Social and Behavioral Sciences, 93*, 1433-1437. https://doi.org/10.1016/j.sbspro.2013.10.058

Lai, Allison (2017). Implementing online platforms to promote collaborative learning in Chinese language classrooms. *Journal of Technology and Chinese Language Teaching, 8*(2), 39-52.

Leu, Don J., & Coiro, Julie, Kinzer, Charles, Castek, Jill, & Henry, Laurie A. (2013). A dual level theory of the changing nature of literacy, instruction, and assessment. (pp. 1150 – 1181). In Norman Unrau and Donna Alvermann (Eds.), *Theoretical models and processes of reading* (6th ed., pp. 1150–1181). International Reading Association.

Liu, Ming-Chi, Huang, Yueh-Min, & Xu, Yo-Hsin (2018). Effects of individual versus group work on learner autonomy and emotion in digital storytelling. *Educational Technology Research and Development, 66*(4), 1009–1028. https://doi.org/10.1007/s11423-018-9601-2

Meletiadou, Eleni (2022). Using educational digital storytelling to enhance multilingual students' writing skills in higher education. *IAFOR Journal of Education, 10*(2), 111-130. https://doi.org/10.22492/ije.10.2.06

Nair, Viknesh & Yunus, Melor (2021). A systematic review of digital storytelling in improving speaking skills. *Sustainability, 13*(17). https://doi.org/10.3390/su13179829

Nicoli, Nicholas, Henriksen, Kine, Komodromos, Marcos & Tsagalas, Dimitrios (2022), "Investigating digital storytelling for the creation of positively engaging digital content", *EuroMed Journal of Business*, *17*(2), pp. 157-173. https://doi.org/10.1108/EMJB-03-2021-0036

Oguilve, Veronica, Wen, Wen, Castek, Jill, Sanderson, Christopher, & Pineda, Zueyzan (2022). Participatory learning: Educators designing media to expand global perspectives. In Bastiaens, Theodoor [Eds.], *Proceedings of EdMedia + Innovate Learning* (pp. 1016-1025). https://www.learntechlib.org/primary/p/221406/

Ohler, Jason B. (2013). *Digital storytelling in the classroom: New media pathways to literacy, learning, and creativity*. Corwin Press. https://doi.org/10.4135/9781452277479

Overdijk, Maarten, Van Diggelen, Wouter, Kirshner, Paul, & Baker, Micheal (2012). Connecting agents with artifacts:. Towards a rationale of mutual shaping. *International Journal of Computer-Supported Collaborative Learning, 7*(2)*, 193-210. https://doi.org/10.1007/s11412-012-9143-2

Paesani, Kate, Dupuy, Beatrice, Liskin-Gasparro, Judith, & Lacorte, Manel (2015). *Multiliteracies Framework for Collegiate Foreign Language Teaching*, Pearson.

Petit, Elise (2020). Digital storytelling for developing students' agency through the process of design: A case study. In Dubuy, Béatrice & Grosbois, Muriel [Eds.], *Language Learning and Professionalization in Higher Education: Pathways to Preparing Learners and Teachers in /for the 21st Century* (pp. 137-166). Research.publishing.net

Pokrzycka, Lidia (2022). *Innovative teaching methods: Project management in practice.* Maria Curie-Skłodowska University Press,

Ribeiro, Sandra P. M., Moreira, António A. F. G., & da Silva, Pinto Cristina M. F. (2016). Digital storytelling: Emotions in higher education. In J. Spector, Micheal Ifenthaler, Dirk, Sampson, Demetrios G. & Isaia,s Pedro (Eds.), *Competencies in teaching, learning and educational leadership in the digital age: Papers from CELDA 2014* (pp. 149–167). Springer International Publishing. https://doi.org/10.1007/978-3-319-30295-9_9

Robin, Bernard (2016). The power of digital storytelling to support teaching and learning. *Digital Education Review, 30*(30), 17–29. https://doi.org/10.1344/der.2016.30.17-29

Roslan, Nur N. A., & Sahrir, Muhammad S. (2020). The effectiveness of ThingLink in teaching new vocabulary to nonnative beginners of the Arabic language. *IIUM Journal of Educational Studies*, *8*(1), 32-52. https://doi.org/10.31436/ijes.v8i1.274

Rusbult, Caryl E., & Van Lange, Paul A.M. (2003). Interdependence, interaction, and relationships. *Annual Review of Psychology, 54*, 351-375. https://doi.org/10.1146/annurev.psych.54.101601.145059

Sanderson, Christopher, Oguilve, Veronica, McLachlan, Mary, Sarkar, Sanjukta, Wen, Wen (2022, July 4-6). *Designing international immersive virtual field experiences (IIVFEs) to teach global digital literacies*. Literacy and Diversity: New Directions. 22nd European Conference on Literacy, Dublin, Ireland.

Schmoelz, Alexander (2018). Enabling co-creativity through digital storytelling in education. *Thinking Skills and Creativity, 28*, 1–13. https://doi.org/10.1016/j.tsc.2018.02.002

Shahid, Maria, &; Khan, Mohd R (2022). Use of digital storytelling in classrooms and beyond., *Journal of Education Technology Systems*, *51*(1), 63-77. https://doi.org/10.1177/00472395221112599

Shen, Xiang, Hao, Chunhui, & Peng, Jian-E (2022). Promoting EFL learners' willingness to communicate through transmediation in a digital storytelling workshop. *Journal of Multilingual and Multicultural Development*, 1–18. https://doi.org/10.1080/01434632.2022.2086257

Slater, Mel, Wilbur, Sylvia, 1997. A framework for immersive virtual environments (FIVE): Speculations on the role of presence in virtual environments. *Presence: Teleoperators & Virtual Environments. 6* (6), 603–616.:https://doi.org/10.1177/00472395221112599

Tahriri, Abdorreeza,; Tous, Maryam D., & ; MovahedFar, Solmaz (2017). "The impact of digital storytelling on EFL learners' oracy skills and motivation". *International Journal of Applied Linguistics and English Literature*, *4*(3), 144–153. https://doi.org/10.7575/aiac.ijalel.v.4n.3p.144

Thorne, Steven L. (2016). Engineering conditions of possibility in technology-enhanced language learning. In Catherine Caws & Marie-Josée Hemel (Eds.),. *Language-learner computer interactions. Theory, methodology and CALL applications* (pp.: 241-246). John Benjamins Publishing Company.

Witmer, Bob G., & Singer, Micheal J. (1998). Measuring presence in virtual environments: A presence questionnaire. *Presence: Teleoperators and Virtual Environments, 7*(3), https://doi.org/10.1162/105474698565686

Appendix
PRE-TASK QUESTIONNAIRE

- **Section 1: personal information**

1. What are your first and last names?*
2. What is your age?*
3. Which languages do you speak?*
4. Amongst the languages you listed above, which one(s) do you consider as native?*

- **Section 2 - Knowledge of Italian language and culture**

1. How would you rate your competence in Italian? (*beginner A1, beginner improver A2, pre-intermediate B1, intermediate B2, advanced C1, native-like C2*)*
2. How many years have you been studying Italian for? (*less than 1 year, between 2 and 4 years, more than 4 years*)*
3. Why are you studying Italian?*
4. In which contexts do you practice your Italian skills the most? (select all that apply)*
    - a. *Talking to locals*
    - b. *Interacting on social media with Italian speakers*
    - c. *Using language learning applications*
    - d. *Watching films/TV series/news in Italian*
    - e. *Reading books/websites in Italian*
    - f. *Self-studying coursebooks*
    - g. *Interacting in online learning communities*
    - h. *Interacting in business contexts/professional lives*
    - i. *Other*
5. What do you like the most about Italian culture? (select all that apply) *
    - a. *Art and design*
    - b. *Literature*
    - c. *Language*
    - d. *Food & Wine*
    - e. *Fashion*
    - f. *Tourism*
    - g. *History*
    - h. *Business*
    - i. *Music*
    - j. *Theatre*
    - k. *Local traditions*
    - l. *Sport & leisure*
    - m. *Other*

- **Section 3 - Knowledge of Italian grammar**

1. Choose the verb that best completes the sentence "penso che lui ... italiano"*
    - a. *Parla*
    - b. *Parli*
    - c. *Parlava*
    - d. *Answer unknown*
2. Choose the verb that best completes the sentence "credevo che lui ... più vecchio"*
    - a. *Sia*
    - b. *Era*
    - c. *Fosse*
    - d. *Anwer unknown*
3. Choose the verb that best completes the sentence "se tu venissi, ... volentieri"*
    - a. *Esco*
    - b. *Uscire*
    - c. *Uscirei*

       d.   Answer unknown

4. Choose the verb that best completes the sentence "... mangiare del sushi questa sera a cena"*
    - *a.   Volevo*
    - *b.   Vorrei*
    - *c.   Volli*
    - *d.   Answer unknown*

5. Choose the verb that best completes the sentence " spero che tu ... studiato"*
    - *a.   Abbia*
    - *b.   Hai*
    - *c.   Avevi*
    - *d.   Answer unknown*

6. Was it difficult to complete the sentences above?*

    1   2   3   4
    Not at all   Extremely

- **Section 4 - Technology use and habits**

1. How competent are you with technology use? *(beginner, intermediate, advanced)**
2. How often do you use your personal computer on a daily basis? *(less than 2 hours per day, between 2 and 8 hours per day, more than 8 hours per day)**
3. What do you use it for? (select all that apply)*
    - *a.   Work (nonuniversity related)*
    - *b.   Academic work (writing essays, exam preparation, course readings...)*
    - *c.   Gaming*
    - *d.   Blogging*
    - *e.   Desktop publishing/editing (Adobe Photoshop, Canva...)*
    - *f.   Writing and data management (Word, Excel or Mac equivalents...)*
    - *g.   Cloud-based video conferencing (ZOOM, Google Meet...)*
    - *h.   Other*
4. How often do you use your mobile phone on a daily basis? *(less than 2 hours per day, between 2 and 8 hours per day, more than 8 hours per day)**
5. Which purposes do you use it for? (select all that apply)*
    - *a.   Social media (including messaging)*
    - *b.   Phone calls (not requiring Internet connection)*
    - *c.   Gaming*
    - *d.   Email management*
    - *e.   Mobile publishing/editing (e.g.: Canva, Photo Editor...)*
    - *f.   Cloud-based video conferencing (e.g.: ZOOM, Google Meet...)*
    - *g.   Other*
6. Do you use language learning applications? *(yes/no)**
7. If you answered "yes", which one(s)?
8. Which of the following platforms have you used for attending online classes? (select all that apply)*
    - *a.   ZOOM*
    - *b.   Google Meet*
    - *c.   Microsoft Teams*
    - *d.   Skype*
    - *e.   Whatsapp*
    - *f.   Facebook*
    - *g.   YouTube*
    - *h.   I have never attended online classes on any platform*
    - *i.   Other*

- **Section 5 - Digital skills**

1. I know how to copy and move files such as documents, images and videos between folders, devices or on the cloud*
    - *j.   I don't know how to do it*

k. I can do it with help
l. I can do it on my own
m. I can do it with confidence and, if needed, I can support/guide others

2. I know how to create a profile in digital environments for personal or professional purposes*
    a. I don't know how to do it
    b. I can do it with help
    c. I can do it on my own
    d. I can do it with confidence and, if needed, I can support/guide others
3. I know how to create something new by mixing different types of content, like text and images*
    a. I don't know how to do it
    b. I can do it with help
    c. I can do it on my own
    d. I can do it with confidence and, if needed, I can support/guide others
4. When I face a technical problem, I am able to find solutions on the Internet*
    a. I don't know how to do it
    b. I can do it with help
    c. I can do it on my own
    d. I can do it with confidence and, if needed, I can support/guide others

● **Section 6 - Online learning**

1. Have you ever worked with teams online? *(yes/no)**
2. If you answered "yes", could you briefly describe your online teamwork experience?
3. Have you ever led teams online? *(yes/no)**
4. Do you agree or disagree with the following statements?*
    (1 – strongly disagree, 2 – disagree, 3 – agree, 4 – strongly agree)
    a. Online language learning improves students' language skills
    b. Online language learning boosts interactions amongst learners
    c. Online language learning accelerates task completion
    d. Online language learning improves coursework management
    e. It is intuitive and fast to learn how to use online language learning resources
    f. Anybody can easily learn a language in online learning contexts
    g. Online language learning can smoothly be integrated in academic curricula

● **Section 7 - Virtual Reality**

1. Are you interested in using Virtual Reality for language learning purposes?*

1   2   3   4
Not at all   Extremely
2. Have you ever had a Virtual Reality experience? *(yes/no)**
3. If you answered "Yes", could you briefly describe it?
4. If you had a Virtual Reality experience, did you like it? (yes/no)
5. Could you briefly explain why?
6. Imagine that you were using Virtual Reality for language learning purposes. Would you agree or disagree with the following statements? (Select one answer for each row)* *(1 – strongly disagree, 2 – disagree, 3 – agree, 4 – strongly agree)*
    a. Virtual Reality improves language learning
    b. Virtual Reality boosts interactivity amongst classmates
    c. Virtual Reality enhances opportunities of authentic language use
    d. It is simple to find information and details in Virtual Reality environments
    e. Virtual Reality is user-friendly and intuitive

POST‑TASK QUESTIONNAIRE

● **Section 1 - language learning with Virtual Reality**

1. Did you enjoy the experience of learning Italian with Virtual Reality? *(yes/no)**
2. What did you like the most about this experience?*
3. What did you like the least about this experience?*
4. How would you rate the applicability of each skill to your professional and social life? * *(1 - very low, 2 – low, 3 – high, 4 - very high)*
    a. *Digital storytelling*
    b. *Presentation planning*
    c. *Speaking practice in Italian*
    d. *Virtual interactions with digital items (e.g: virtual objects...)*
    e. *Avatar interactions with my classmate*
5. Do you feel that Virtual Reality improved your Italian language skills? *(yes/no)**
6. If you answered "yes", how do you think you will use the language skills you have acquired?*
7. Think about your experience of learning Italian through Virtual Reality and rate your agreement with the following statements* *(1 – strongly disagree, 2 – disagree, 3 – agree, 4 – strongly agree)*
    a. *Virtual Reality facilitated language interactions with my classmate*
    b. *Virtual Reality was useful for collaboration*
    c. *The use of Virtual Reality facilitated me in requesting the help of my classmate when there were issues with task conduction*
    d. *Using hand controllers and VR headset facilitated language interactions with my classmate*
    e. *Conversations flowed as easily as they would in face-to-face contexts*
8. Do you feel that the digital tour created with your partner is more the result of your decisions, your partner's decisions or both? (*more mine, my partner's, both*)*
9. Think about your experience with Virtual Reality and rate your agreement with the following statements* *(1 – strongly disagree, 2 – disagree, 3 – agree, 4 – strongly agree)*
    a. *I found it difficult to interact with my classmate in Virtual Reality*
    b. *I felt inhibited from expressing my opinions in Virtual Reality*
    c. *I felt prevented from being a group leader in Virtual Reality*
    d. *I felt Virtual Reality prevented me from proposing new ideas to my classmate*
10. Did you find it easy to reach an agreement with your partner on selecting tour destinations when immersed in Virtual Reality? *(yes/no)**
11. Why?*
12. After your experience, do you feel more inclined to use Virtual Reality for collaborative language learning purposes? *(yes/no)**

- **Section 2 - sense of presence in Virtual Reality**

1. How much were you able to control the events?*

1	2	3	4	5	6	7

Not at all able to   *Completely*

2. How responsive was the environment to actions that you initiated or performed?*

1	2	3	4	5	6	7

Not at all responsive   *Very responsive*

3. How natural did your interactions with the virtual environment seem?*

1	2	3	4	5	6	7

Not natural at all   *Very natural*

4. How much did the visual aspects of the environment involve you?*

1	2	3	4	5	6	7

Not at all   *Completely*

5. How much did the auditory aspects of the environments involve you?*

1	2	3	4	5	6	7

Not at all   *Completely*

6. How natural was the mechanism which controlled changing between the different environments?*

1	2	3	4	5	6	7

Not natural at all   *Very natural*

7. How compelling was your sense of objects moving through space?*

1   2   3   4   5   6   7
Not at all compelling   Very compelling

8. How much did your experiences in the virtual environments seem consistent with
your real world experiences?*
1   2   3   4   5   6   7
Not at all consistent   Very consistent

9. Were you able to anticipate what would happen next in response to the actions you performed?*
1   2   3   4   5   6   7
Not at all   Completely

10. How completely were you able to actively survey or search the environments using your vision?*
1   2   3   4   5   6   7
Not at all   Completely

11. How well could you identify sounds?*
1   2   3   4   5   6   7
Not well at all   Very well

12. How well could you localise sounds?*
1   2   3   4   5   6   7
Not well at all   Very well

13. How well could you actively survey or search the virtual environment using touch?*
1   2   3   4   5   6   7
Not well at all   Very well

14. How compelling was your sense of moving around inside the virtual environment?*
1   2   3   4   5   6   7
Not at all compelling   Very compelling

15. How closely were you able to examine objects?*
1   2   3   4   5   6   7
Not close at all   Very close

16. How well could you examine objects from multiple viewpoints?*
1   2   3   4   5   6   7
Not well at all   Very well

17. How well could you move or manipulate objects in the virtual environmental experience?*
1   2   3   4   5   6   7
Not well at all   Very well

18. How involved were you in the virtual environment experience?*
1   2   3   4   5   6   7
Not at all involved   Very involved

19. How much delay did you experience between your actions and expected outcomes?*
1   2   3   4   5   6   7
Full delay   No delay

20. How quickly did you adjust to the virtual environment experience?*
1   2   3   4   5   6   7
I did not adjust to it at all   It took me less than a minute to adjust to it

21. How proficient in moving and interacting with the virtual environment did you feel at the end of experience?*
1   2   3   4   5   6   7
Not proficient   Very proficient

22. How much did the visual display quality interfere or distract you from performing the assigned tasks or required activities?*
1   2   3   4   5   6   7
Not at all   Completely

23. How well could you concentrate on the **assigned tasks or required activities** rather than on the **mechanisms** used to
perform those tasks or activities?*
1   2   3   4   5   6   7
Not at all   Completely

24. How much did the control devices interfere with the performance of assigned tasks or with other activities?*
1   2   3   4   5   6   7
Not at all   Completely

25. How completely were your senses engaged in these experiences?*

1   2   3   4   5   6   7
Not engaged at all   Completely engaged
26. To what extent did events occurring outside the virtual environment distract you from your experience in the virtual environment?*
1   2   3   4   5   6   7
Not at all   Very much
27. Overall, how much did you focus on using the display and control devices instead of the virtual experience and experimental tasks?*
1   2   3   4   5   6   7
Not at all   Very much
28. Were you involved in the experimental task to the extent that you lost track of time?*
1   2   3   4   5   6   7
Not at all   Completely
29. How easy was it to identify objects through physical interaction, like touching an object, walking over a surface, or bumping into a wall or object?*
1   2   3   4   5   6   7
Not easy at all   Very easy
30. Were there moments during the virtual experiences when you felt completely focused on the task or environment?*
1   2   3   4   5   6   7
Not at all   Many
31. How easily did you adjust to the control devices used to interact with the virtual environments?*
1   2   3   4   5   6   7
Not at all   Completely
32. Was the information provided through different senses in the virtual environment (e.g., vision, hearing, touch) consistent?*
1   2   3   4   5   6   7
Not at all   Completely

● **Section 3 - post- activity comfort with Virtual Reality**

1. General Discomfort*
1   2   3   4
None   Severe
2. Fatigue*
1   2   3   4
None   Severe
3. Headache*
1   2   3   4
None   Severe
4. Eye strain*
1   2   3   4
None   Severe
5. Difficulty focusing*
1   2   3   4
None   Severe
6. Salivation increasing*
1   2   3   4
None   Severe
7. Sweating*
1   2   3   4
None   Severe
8. Nausea*
1   2   3   4
None   Severe
9. Difficulty concentrating*
1   2   3   4
None   Severe

10. "Fullness of the head"*

1	*2*	*3*	*4*
None			*Severe*

11. Blurred Vision*

1	*2*	*3*	*4*
None			*Severe*

12. Dizziness with open eyes*

1	*2*	*3*	*4*
None			*Severe*

13. Dizziness with closed eyes*

1	*2*	*3*	*4*
None			*Severe*

14. Vertigo*

1	*2*	*3*	*4*
None			*Severe*

15. Stomach awareness*

1	*2*	*3*	*4*
None			*Severe*

16. Burping*

1	*2*	*3*	*4*
None			*Severe*

- **Section 4 - usability of Virtual Reality**

1. I think that I would like to use VR for language learning purposes more often*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

2. I found performing VR lessons unnecessarily complex*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

2 I thought using VR for language learning purposes was easy*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

3. I think that I would need the support of a technical person to be able to use VR for language purposes again*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

4. I found the various functions in this system were well integrated*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

5. I thought there was too much inconsistency in this system*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

6. I would imagine that most people would learn very quickly to use VR for language learning purposes*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

7. I found the system very cumbersome to use*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

8. I felt very confident using the system*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

9. I needed to learn a lot of things before I could get going with this system*

1	*2*	*3*	*4*	*5*
Strongly disagree				*Strongly agree*

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