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Final Thesis

Learning Italian As a FL via Virtual Museum Tasks: The Effects on Students' Positive Interdependence

Supervisor
Ch. Prof. Graziano Serragiotto

Assistant supervisor
Ch. Dr. Fabiana Fazzi

Graduand
Ilaria Compagnoni
882492

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“No man is an island, entire of itself;
every man is a piece of the continent, a part of the main.”
John Donne

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ABSTRACT

Situations of interdependence arise as individuals establish relationships of mutual reliance for the purpose of achieving common goals. Interdependence is essential in the field of language education as individuals learn from and with others, collaboratively acting to overcome communicative and task-based challenges. With the Covid-19 pandemic of 2020 and the consequent deprivation of in-person interactions and opportunities to travel, virtual resources have increasingly been incorporated in language education to engage individuals in online interactions. Despite considerable changes brought by technology to the dynamics of learning groups, little research has yet been devoted to the long-term effects of virtual interfaces on interdependence in language education. Drawing from studies on social interdependence applied to collaborative language learning, this thesis discusses the results of online teaching interventions carried out in two institutions in the United Kingdom on a group of undergraduate and postgraduate students of Italian as FL. The purpose of the interventions was to analyse the impact of virtual museums on students' positive interdependence in online language learning contexts. By using *Kahoot!*, *ThingLink* and *Google Arts & Culture*, students completed task-based language activities on exploring virtual galleries to select artwork on specific criteria. Data was collected via a mixed-methods design consisting of online classroom observations, a questionnaire, focus groups and tutors' interviews. Overall results confirmed that the use of virtual museums in online language classes can support students' positive interdependence by fostering cooperation, turn-taking, negotiation and role-assignment when interactions are constrained by e-learning.

Keywords: e-learning, interdependence, virtual museums, task-based language learning with technology

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I thank my family, friends and classmates who, like myself, in challenging times of social distancing have found innovative ways to use digital environments to connect and work with others. If we look back now, we can see how much we have accomplished together. This is the kind of interdependence this thesis is rooted in.

"Alone we can do so little;
together we can do so much."
(Helen Keller)

Learning is a social process of goal achievement as individuals heavily rely on each other's efforts to achieve mutual goals (Deutsch, 1949b; Johnson & Johnson, 2005). This situation is defined as positive interdependence and constitutes the cornerstone of social interactions. Often researched in terms of social participation, *positive interdependence* sets the foundations of collaborative group work and justifies goal-oriented behaviours.

It is essential to contextualise these enquiries in language education since linguistic knowledge is pragmatically acquired when individuals learn from and with others, collaboratively acting to overcome communicative and task-based challenges. The rapid integration of technology in instructional methods implies that social interactions have become increasingly digital, with positive outcomes for language learning. In fact, researchers have found that technological tools contribute to students' accomplishment of group tasks and add authenticity to the activities (Thorne, 2016; Redondo, 2015). Consequently, digital tools utilisation affects students' interdependence, hinting at possible creations of sustainable educational technologies supporting users' interactions and content retention (Cerratto Pargman, Nouri, & Milrad, 2017; Raith & Hegelheimer, 2010; Müller-Hartmann & Schocker-v. Ditfurth, 2010; Ingrassia, 2014; Ally, 2019). With particular reference to learning Italian as a Foreign Language (FL), the incorporation of multimedia technologies in education has been shown to have positive effects on learning enhancement as it fosters words-images associations and mental representations of learnable content, with increases in participants' motivation and engagement (Berti, 2019, 2020a, 2020b; 2020c; Elia, 2017; Tyrou & Mirkos, 2018). The consequential impact of these technologies on language students' behaviours has resulted in redefinitions of mutual perceptions and interactions which made it necessary to deploy digital tools to nurture students' interdependence in remote modalities.

The current research

This research project developed in the aftermath of the Covid-19 pandemic as social restrictions underlined the importance of investigating students' interdependence to cast

light on evolving technological practices in language education. In fact, with the pandemic-related deprivations of in-person interactions and opportunities to travel, virtual resources have increasingly been incorporated in language education to nurture online interactions. Despite considerable changes brought by technology to the dynamics of group learning, little research had been devoted to the long-term effects of virtual interfaces on interdependence in language education.

To identify the effects of digital resources on students' interdependence in online language learning contexts, interventions were conducted on a group of learners using virtual museums in online activities of Italian as a FL. The question which this research attempted to answer was:

- What are the effects of virtual museums on students' positive interdependence in online classes of Italian as FL?

In light of the above considerations, it was believed that incorporating virtual museums in language activities would maximise positive students' interdependent relationships to reach task goals. It was also hypothesised that interdependence would surface as:

- Pro-social behaviours of negotiations and goal-orientation.
- Perceptions of peer collaboration as necessary to attain activity goals.
- Perceived ownership of the final product of the activity.
- Perceptions of individual contributions as valuable and effective to reach goals.

The structure of the thesis

Chapters 1, 2 and 3 are dedicated to the literature review covering social and psychological theories of interdependence, Task-Based Language Learning (TBLL) and educational technology. Chapters 4, 5 and 6 provide a description of the research methodology, an analysis and a discussion of the interventions' results. Chapter 7 displays a summary of the findings and draws conclusive remarks.

Chapter 1 explains interdependence from social and psychological perspectives with particular reference to individual factors of motivation and autonomy as well as in terms of social aspects of negotiation, goal-orientation and leadership. Examples from the literature are provided in order to demonstrate that interdependent behaviours positively impact language learning effectiveness (Johnson & Johnson, 2005; Laal, 2013; Gentile,

2016). The review also identifies missing research on interdependence applied to language learning with technology and on suitable task-based methodologies supporting students' mutual reliance in contexts of digital educational.

Chapter 2 provides an overview of the methodology of Task-Based Language Learning (TBLL) with technology (Ellis, 2003). In light of considerations on multiliteracies and e-learning, it analyses implications for interdependence when students are involved in language activities delivered with digitals tools. The chapter also outlines missing research in interdependence-supporting task-based language activities in digital learning contexts.

Chapter 3 describes aspects of educational technology from the point of view of interdependence-based virtual contexts and analyses the benefits of Extended Reality (XR) for social engagement in language learning. Moreover, it defines the concept of digital immersion, outlines interactions in digital spaces and describes virtual language learning through gamification for the development of intercultural awareness. It also describes museums' implementations of digital tools in virtual collections constituting potential materials for task-based language activities supporting students' mutual dependence in reaching task goals. Furthermore, it considers the necessity to identify interdependence-supporting materials in language learning to compensate for the drawbacks of absenteeism and disengagement in remote language learning.

Chapter 4 describes the materials and structure of the task-based activities adopted in the study. It provides screenshots of the platforms *Kahoot!*, *ThingLink* and *Google Arts & Culture* through which students explored virtual galleries and selected artwork on specific criteria. Descriptions of the participants and the institutions involved in the study are also provided.

Chapter 5 analyses the results obtained from online classroom observations, a questionnaire, focus groups and tutors' interviews according to the parameters of interdependence that surfaced during the interventions, which include clarification seeking, negotiations and goal-orientation.

Chapter 6 contextualises the results within the literature by providing considerations on the parameters observed in the course of students' interactions. In light of the research findings, it also discusses whether the utilisation of virtual museums in online language classes can significantly impact students' positive interdependence when physical interactions are constrained by distances and technological media. The chapter also overviews research limitations and outlines potential future directions.

It is believed that the current research may contribute to clarify the utilisation of virtual museums for language educational purposes and support students' interdependence in online language activities by stimulating motivation, interactions, creativity, curiosity and group engagement. These elements are considered necessary to support learners when digital changes in language education force students to adapt to multi-faceted interactional environments without losing mutual dependability in reaching target goals. In fact, implementations of digital tools in education may strengthen individual self-sufficiency to the point of increasing isolation and social detachment. This can negatively impact language education since its success depends on co-construction of meaning and task-oriented mutual support. In sum, the more interdependent-aware the language students are, the more effectively they can achieve their life purposes by interacting with others through the acquired languages. In fact, as Erik Erikson mentioned, "life doesn't make any sense without interdependence. We need each other, and the sooner we learn that, the better for us all".

CHAPTER 1. INTERDEPENDENCE

Human nature is inherently social. Centuries of evolution have led human beings to develop intertwined relationships between individuals to survive, thrive and face life challenges ("The cooperative human", 2018). It appears that the more frequent the interactions, the more individuals are likely to establish long-lasting relationships with increasing cooperation emerging as a stable evolution strategy (Hilbe, Chatterjee, & Nowak, 2018). Despite interactional variations in different situational contexts, it has been observed that individuals display recurring behavioural patterns related to the social situation they are immersed in (Fehr & Schurtenberger, 2018). For instance, individuals may show defensive or aggressive behaviours in conflicts or conversely reveal positive dispositions through negotiations, mediations and helpful attitudes (Rusbult, & Van Lange, 2003; Johnson & Johnson, 2005; Gentile, 2016). Therefore, not only human interactions are situationally driven, but are also dictated by scopes which are individual or mutual in nature. Goal types are thus the driving force behind human interactions which unfold in goal-oriented communicative behaviours underpinned by linguistic, non-linguistic and intercultural competences (Thorne, 2003; Caon & Balboni, 2015; Caon, Battaglia, & Birchese, 2020). Thus, interaction analysis becomes of pivotal importance in studies on social behaviours as perceptions of mutual dependence enable individuals to accomplish tasks (Johnson & Johnson, 2005). The situation of reciprocal instrumentality that arises from these contexts is defined as *interdependence*.

In this chapter, interdependence will be described from the point of view of social theory and analysed in both its psychological and situational aspects. Subsequently, factors underlying interdependence will be examined in individual and group dynamics unfolding in leadership, negotiation and goal-oriented behaviours. Moreover, literature on the application of these parameters in education will be examined with specific reference to language instruction.

1.1. A social theory of interdependence

Interdependence arises when individuals establish relationships of mutual reliance for the purpose of achieving common goals (Deutsch, 1949b; Johnson & Johnson, 2005). Given that human actions are contextually driven, Gentile (2016) argues that the type of

situation in which individuals are involved determines the kind and intensity of the interdependent bonds established between them. Johnson & Johnson (2005) expand this stance by identifying goal structure as a key factor of interdependence as it governs modalities of human interactions. In this respect, while interdependence is tied to situational contexts, interactions define "individuals' simultaneous or sequential actions that affect the immediate and future outcomes of the other individual involved in the situation" (Johnson & Johnson, 2005, p. 316). Interactions generate opportunities for individuals to communicate and facilitate goal attainment (Oxford, 1997). However, not all interactions are directed to increase chances of successful goal accomplishment amongst participants. In fact, individuals may act to promote their own scopes or hinder the success of others in reaching the same objectives. The latter condition gives rise to *negative interdependence*, a phenomenon of oppositional interactions reducing the likelihood of success in achieving targets as individuals focus on increasing their own productivity, obstructing each other's efforts with communicative tactics of threat, distrust and deceit (Deutsch, 1949a). Conversely, *positive interdependence* arises when the gains of one person are associated with the gains of others. In other words, it is the result of promotive interactions leading to the display of pro-social behaviours aimed at increasing the success of others in goal attainment with benefits including the establishment of trust, cooperation, positive power and conflict resolution (Oxford, 1997; Johnson & Johnson, 2005). An analysis of interdependence should thus depart from investigations on the range of contextual interactions and behaviours.

A situational analysis of interdependence implies an analysis on the interactional dimensions driven by goal orientation and resulting in situational behaviours and psychological investments. These can be described by outcome matrices and transition lists, which outline the impact of interdependence on agents and interactive partners (Rusbult & Van Lange, 2003; Wagner, 2011). Within this framework, the establishment of interdependent relationships is subject to participants' successful or unsuccessful gratifications in partners' interactions on the basis of behavioural choices. To analyse contextual degrees of interdependence, Rusbult and Van Lange (2003) identified four aspects related to the intensity of situational dependence (Fig. 1).

Level of dependence	Degree of individuals' reliance on partners.
Mutuality of dependence	Degree of equal dependency amongst partners.
Basis of dependence	Degree of individual influence over mutual outcomes.
Covariation of interest	Degree of correspondence in partners' outcomes.

Fig. 1. Adapted from "Interdependence, interaction, and relationships" by C.E. Rusbult, P.A.M. Van Lange, P.A.M. (2003). *Annual Review of Psychology, 54*, pp. 354-356.

Each dimension implies the presence of two potential outcomes: corresponding or conflicting interests. Therefore, resulting behaviours either facilitate or obstruct individual capabilities to reach goals.

The list in Fig. 1 can be used to describe the potential behaviours arising from situational dependence (Fig.2), where dimensions combine together and give rise to interactions based on specific goals and motives. Consequently, a situational analysis of interdependence sheds light on human behaviours and interactions as well as explaining the reasons behind individual goals. In other words, investigating interdependence shows that individuals operate interactively according to the affordances made possible by the situations they experience (Kelley et al., 2003).

	Positive correlation	**Negative correlation**
Level of dependence	Congenial interactions.	Vulnerability. Insecurity.
Mutuality of dependence	Positive emotional experiences. Balance of power.	Exploitation. Coercion. Norm reliance.
Basis of dependence	Coordination. Problem-solving. Spontaneous activity taking.	Communication patterns of threat and over-reliance on behavioural norms.
Covariation of interest	Cooperation and trust.	Greed. Fear. Information-seeking rising from doubt of trust.

Fig. 2. Adapted from "Interdependence, interaction, and relationships" by C.E. Rusbult, P.A.M. Van Lange, P.A.M. (2003). *Annual Review of Psychology. 54*, pp. 354-356.

The term *affordance* refers to the possibilities generated by situations and to the actions, behaviours and skills they enable individuals to activate. Such affordances are important to describe the degrees of interdependence established amongst individuals since correlated behaviours affect the impact of individual outcomes on personal (actor control), other persons' (partner control) and mutual actions (joint control). Specifically, the amount of control exercised by interacting individuals influences interdependent, dependent and individual goal attainment. Within this framework, situations are interpersonal realities where people activate their motives, orient their cognition and interactions (Van Lange & Rusbult ,2012).

A summary of the main characteristics of situational interdependence from the perspective of behavioural involvement can be summarised as follows:

Situational Dimension	Relevant Motives
Level of dependence	Comfort versus discomfort with dependence and comfort versus discomfort with independence.
Mutuality of dependence	Comfort versus discomfort with vulnerability (as dependent). Comfort versus discomfort with responsibility (as power holder).
Basis of dependence	Dominance (leading) versus submissiveness (following). Assertiveness versus passivity.
Covariation of interests	Prosocial versus self-interested motives (rules for self). Trust versus distrust of partner motives (expectations about others).
Temporal structure	Dependability versus unreliability. Loyalty versus disloyalty.
Information availability	Openness versus need for certainty. Optimism versus pessimism.

Fig. 3. Adapted from "Interdependence Theory" by P. A. M Van Lange, & C.E. Rusbult, C.E. (2012) in P.A.M. Van Lange & A.W. Kruglanski, E.T. Higgins (Ed.), *Handbook of Theories of Social Psychology: Volume 2*, p.255.

Another dimension influencing interdependence but not contingent to human actions is information availability. In fact, the extent to which individuals engage in social situations according to available resources and contingencies may impact other individuals' reactions and attitudes. To clarify this dimension in terms of behavioural patterns, Rusbult and Van Lange (2003) provided the hypothetical example of two people who have planned to go on a vacation together. The sudden pressing work deadline of one partner and the consequent decision of not joining the holiday induce the other individual to negatively judge the benevolence of such motives. Since this person does not possess sufficient information to confirm the validity of the partner's reasons, he or she may reconsider relationship investment in terms of commitment and dependency. This behavioural state is by no means fixed. In fact, individual stances may change as more information becomes available and partners' knowledge is nurtured. Therefore, what emerges is a dynamic and mutable set of interactions which evolve with time. Consequently, contextual interdependence enables a behavioural investigation of future attitudes and outcomes. In fact, by analysing changes brought by social situations, individuals respond to strategic concerns related to their long-term goals and willingness to influence partners'

results (Rusbult & Van Lange, 2003). The graph in Fig.4 describes situational and behavioural transformations in terms of mutual influence between affordances, goals and psychological factors. It also shows that relationships between given situations and individual dispositions lead to transformational processes which change the course of situations potentially arising from interdependent interactions.

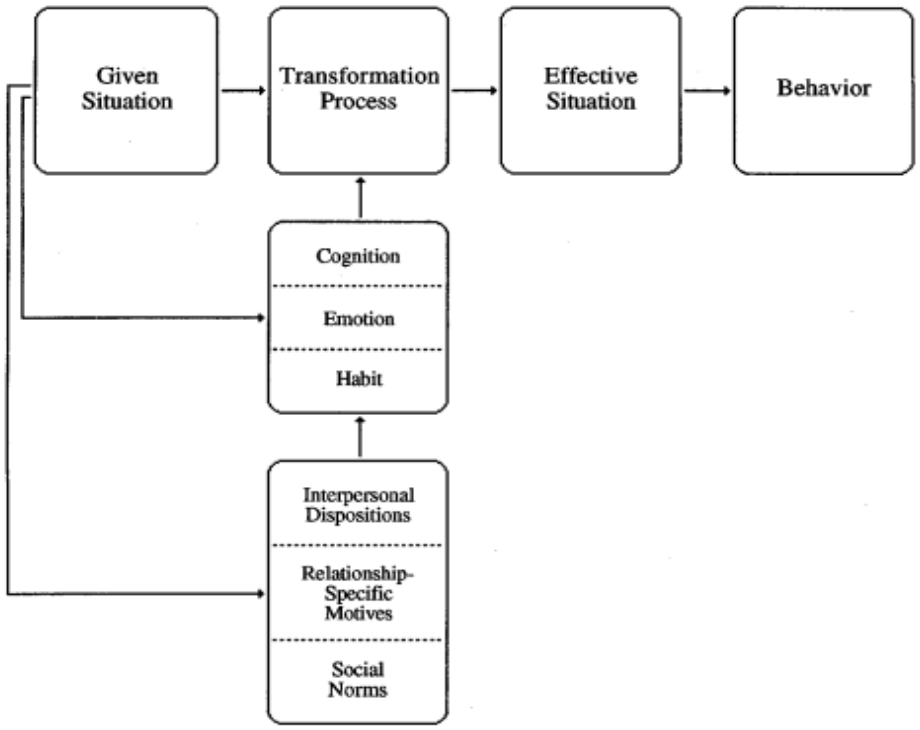

Fig. 4. Reprinted from "Interdependence, interaction, and relationships" by C.E. Rusbult, P.A.M. Van Lange, P.A.M. (2003). *Annual Review of Psychology, 54*, p. 359.

Since individuals learn, give meaning to their experiences and construct their personalities on interactional experiences, their behaviours and attitudes are also involved in similar processes of change. Consequently, a situational analysis of interdependence is linked to an investigation on the psychological impact that social contexts have on individuals. Johnson and Johnson (2005) explain the psychological implications of interdependent behaviours using the theory elaborated by Deutsch (1949a) who described affordances of interdependent interactions according to behavioural actions. He depicted an action-based continuum with opposite ends of effective and bungling actions, which could respectively facilitate or impede chances of goal-attainment. This perspective emphasises the effects of interdependence in psychological processes, measurable in terms of attributes of substitutability, cathexis and inducibility. The following table describes three psychological characteristics of interdependence with its corresponding affordances in cooperative situations.

Psychological attributes	Definitions	Cooperative actions	Competing actions
Substitutability	Degree of substitutability of one person's actions.	Extensions of extra effort in making up for the ineffective actions of others.	Ineffective competitors' actions substitute for the opponents' effective actions unless they engage in effectively increasing the amount and effort required to win.
Cathexis	Degree of psychological investment in objects outside of oneself (friends, family, work).	Likelihood of engagement in effective activities of goal attainment. Long-lasting effects in motivation and engagement. In-group favouritism.	Negative actions as consequences of failure in goal attainment.
Inducibility	Degree of individual openness in influencing others or being influenced by them.	Engagement in actions for the promotion of goal achievement and avoidance of activities interfering with task goals. Channelling individual efforts towards goal attainment and viability of cooperation.	Avoidance of inducing partner's assistance unless to encourage partners' bugling actions. Prevention or obstruction of participants' effective actions.

Fig. 5. Adapted from "New Developments in Social Interdependence Theory" by D.W. Johnson & R.T. Johnson. *Gender, Social, and General Psychology Monographs, 131*(4), pp. 289-292.

The psychologically-based social interdependence theory proposed by Johnson and Johnson (2005) is outlined in Fig 6. Whilst still considering the importance of situational behaviours, the authors start their analysis from the psychological processes from which

interdependent actions and behaviours surface. Situational and psychological behaviours stem from the type of goals involved in the kind of relationships individuals invest time and effort in. Scope typologies may create conflicts between self and group interests which, when mediated and negotiated, are able to induce individuals to act interdependently. Similar phenomena have been observed cross-culturally, confirming the scientific validity of these theories (Johnson & Johnson, 2005; Gentile, 2016).

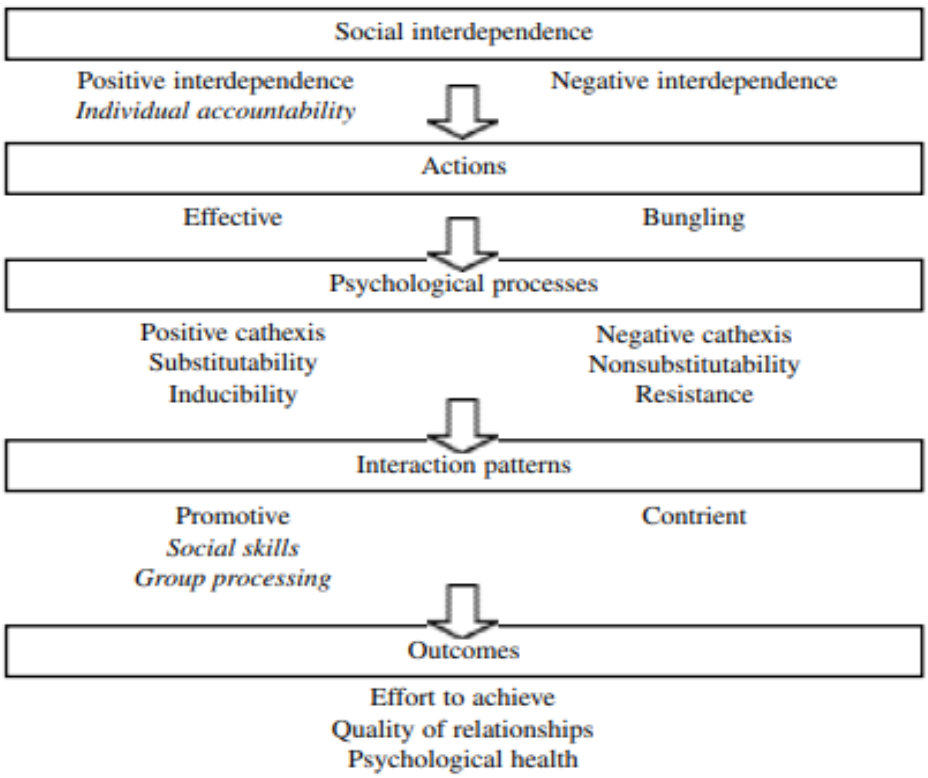

Fig. 6. Reprinted from "New Developments in Social Interdependence Theory" by D.W. Johnson & R.T. Johnson. *Gender, Social, and General Psychology Monographs, 131*(4), p. 289.

Given the influence of interdependent situations on situational and psychological aspects of human interactions, an investigation on interdependence is particularly relevant when applied to education and cooperation as it creates the conditions for understanding key aspects underlying group behaviours and learning processes.

1.2. Attributes of interdependence and their applications in social situations

Interdependence theory has been mainly been applied to the education and job sectors to analyse group dynamics and learning processes which are of pivotal importance in considerations of the social situations impacted by evolvable interactions' outcomes.

Therefore, by being highly dependent on individual dispositions, considerations of practical applications of interdependence must depart from an analysis of motivation as a key factor underpinning goal-driven behaviours.

1.3. Motivation, autonomy and interdependence

Motivation has been defined as a personal "multifaceted construct which initiates, directs, coordinates, amplifies, terminates, and evaluates the cognitive and motor processes whereby initial wishes and desires are selected, prioritised, operationalised and acted out" (Dörnyei & Otto, 1998, p.65). In other words, motivation is a key initiator of human actions and the main determiner of individuals' willingness to engage in interactions with others. According to Dörnyei (1994), motivation starts when individuals set goals, form intentions to accomplish them and launch into action. In particular, he postulates that individuals evaluate their scopes according to the following six parameters:

Proximity	Temporal proximity of goal achievement.
Relevance	Relevance of goals to individual scopes.
Values	Goal-associated benefits.
Attitudes	Individual dispositions towards the targets.
Expectancy of success	Likelihood of goal accomplishment.
Coping potential	Endurance to reach the objectives despite the challenges.
Situational settings	Examination of the situation in which goals are going to be pursued (including group compositions).

Once individuals use the abovementioned attributes to judge goals as a match to their interests, they tend to maximise their opportunities to attain them and are consequentially more inclined to rely on the instrumental potentiality of others to reach their objectives (Coonan, 2020). This is why motivation needs to be nurtured throughout the goal-attainment process to ensure the establishment of positive interdependent relationships amongst group members. In fact, individuals extend their evaluations to their partners by assessing group characteristics, members' personality traits, behavioural norms and orientation to group objectives (Stangor, 2013; Coonan, 2020). Consequently, it can be safely assumed that individuals are likely to establish interdependence should their peers' appraisals lead to positive results.

Motivation can also give rise to attitudes reinforcing or undermining interdependence. With reference to language learning contexts, individuals may display open dispositions to learn from native speakers, mingle with them and be curious to study their cultures. However, not all students perceive interactions as an added value to their learning. In fact, receptive individuals are more likely to establish interdependency bonds with partners in language-based tasks. Conversely, individuals with defensive attitudes tend to perceive their identity threatened by being in contact with different cultures and consequently feel less inclined to learn a language (Byrd, 2009).

Another motivational aspect quoted in the literature is the likelihood of interdependence to surface as goal-driven motivation when it is perceived as similar in type and intensity to other group members. Therefore, it emerges that situations alone are not sufficient to account for behavioural attitudes since they are also triggered by individual and intrinsic motives. When contextualised in language learning, methodologies must account for individuals' representations of others involved in the same situation and for self-representations leading individuals to autonomously participate in learning contexts. In fact, as argued by Dörnyei (1994), in order to succeed in achieving targets, individuals need to possess strong self-concepts which can be summarised as follows:

Self-image	Seeing themselves in a good light.
Self-esteem	Have pride of their efforts in their learning process.
Self-efficacy	Efficacy perceived when the challenge is pitched to individual capabilities.
Self- actualisation of scopes	Goal accomplishment of set goals.
Self-determination	Persistence to attain goals in learning situations.
Self-confidence	Certitude of own abilities to succeed in a goal.
Self-regulation	Be in control of the learning process.

The presence of the previous self-concepts is a prerequisite of learners' autonomy which is an additional key factor in determining the quality and nature of group interactions. As argued by Lu, Liu and Huang (2020) and Nguyen (2016), individuals need to possess some degree of autonomy before perceiving the value of group work in goal-attainment and engage in interdependent relationships with their peers. Specifically, autonomy has been described as the ability to take charge of one's own learning (Holec, 1981), the willingness to achieve a goal for fulfilling purposes (Deci & Williams, 1996) and to take responsibility for one's own learning (Benson, 2006). One of the main properties of autonomy is that it permeates communal relations transforming learning in a

social and cultural activity as individuals communicate to learn from and with each other (Little, 1991; Menegale, 2020). Therefore, possessing autonomy enables people to interact with others and say what they want. In other words, autonomous and motivated students are more likely to build a wide variety of mutually beneficial relationships (Loh & Ang, 2020).

The psychological importance of factors including motivation, autonomy, goal attainment and learning content implies that individuals orientate their actions towards scopes when they are confident of their self-regulating abilities. Only when these conditions have been reached will they be inclined to interact with people in interdependent manners. These psychological processes have been utilised to design cooperative learning methodologies grounded on individuals' inclinations to interdependently cooperate and succeed in tasks.

1.4. Interdependence as the foundation of cooperative learning

Psychological dimensions of individual motivation and autonomy combined with situationally-triggered behaviours provide the context for social interactions and positive group attitudes to surface in goal-oriented relationships (Johnson & Johnson, 2005; Gentile, 2016). "Social interactions" are defined as mutual relationship-building exchanges and degrees of perceived salience of interpersonal bonds (Walker, 2007; Tu & McIsaac, 2002). Consequently, interdependence has the effect of boosting collective efficacy as well as cohesion and affiliation. This has been identified as one of the success variables in high group performances, as interdependence fosters group efficacy (Bandura, 2000). Therefore, it can be said that interdependence creates the conditions for cooperation to emerge as the main tenet of goal-oriented joint efforts. This becomes particularly relevant for social constructivist learning theories according to which education occurs when people participate in sociocultural activities since ideas are constructed through mutual communication (Vygotsky, 1986; Oxford, 1997). Therefore, as learning cannot be separated from social life, an analysis of interdependence applied to the field of education implies an essential discussion on collaborative approaches to group learning.

Cooperative learning is defined as an interdependence-based methodology of social mediation and peer instruction (Gentile, 2016; Caon, Birchese, & Battaglia 2020). A key assumption of this method is that within cooperative frameworks, interpersonal connections between participants favour learning, social and cognitive development (Comoglio & Cardoso, 1996). In fact, if used with phyco-pedagogical intents, cooperative learning

intensifies interdependence amongst individuals by maximising partnering opportunities (Lamberti, 2010). Furthermore, being a method focused on social mediation, it encourages individuals to adopt flexible learning methodologies to adjust to the different situations arising from goal-attainment processes (Kagan, 2000).

Benefits of cooperative learning for group interactions have been demonstrated in professional contexts where mutual understanding and positive interactions were observed in interdependent associations (Klepetar & Arthur, 1992; Janssen, Van De Vliert & Veenstra, 1999). However, it is in the education field that cooperative learning has been extensively applied and analysed. In fact, research has shown that students involved in group work tend to maximise each other's learning potentials by cooperatively promoting interactions for goal achievement (Johnson, Johnson & Holubec, 1996). As a result, interdependent students are more inclined to overcome task-based challenges, perceive individual contributions as worthwhile and positively value group work as a collective effort towards goal attainment (Johnson & Johnson, 2005; Kagan, 2007; Laal, 2013; Lu, Liu & Huang, 2020).

In order to proceed with an analysis of interdependence in educational contexts, it is important to distinguish cooperation from collaboration as the terms are often used interchangeably and are both incorrectly believed to entail some degree of partners' instrumentality in goal attainment. However, in collaborative groups individuals lack an interdependent structure supporting members' work and role division, with the result that individuals are more likely to delegate responsibilities to others and may quickly become demotivated in reaching their scopes. Conversely, cooperative groups comprise students who share responsibilities, engage in tasks, develop and strengthen teamwork to increase learning opportunities (Caon, Battaglia & Birchese, 2020). Therefore, it is essential that individuals involved in group activities have clear visions of the goals to achieve. In this way, they can perceive group efficacy as goal-oriented individual performances combined to their peers' contributions, rather than performing tasks on individual basis (Johnson, Johnson, & Holubec, 1996; Loh & Ang, 2020). Despite the potential risks of group work leading to demotivation in highly-skilled individuals and the creation of proficiency-based dependent relationships, results lead to valorisations of learning styles and differences, as well as perceptions of the necessary instrumentality of others to reach group targets (Kagan, 2000; Kover & Worrell, 2010). In other words, individual weaknesses in goal attainment are filled with other people's help (Loh & Ang, 2020).

Despite the importance of individual contributions in understanding the positive effects of interdependence, cooperation is also a skill which must be learned by students

and fostered by teachers. On this matter, Loh and Ang (2020) have outlined some key competences that students need to acquire to establish interdependent and cooperative relationships:

- Awareness that individual efforts lead to group gains.
- Promotively interact to encourage each other to reap rewards.
- Possession of the willingness to interact, elaborate, clarify misconceptions and discuss viewpoints with group members.
- Act in trusting and trustworthy ways.
- Constructively participate in interactions, provide feedback and challenge reasoning for group advancement.

Consequential benefits for social competences include the ability to interact and get along with others, develop social skills, use social language in context, appreciate other people's views and support each other in the learning process. Moreover, the more these relationships are nurtured in cooperative situations, the more participants have the motivation to keep learning (Johnson et al., 2014). Within this analysis, teachers' ability to design tasks providing the foundations of students' positive interdependence is of pivotal importance since cooperative skills are highly dependent on activity structures and contents. Other variables related to the creation of effective interdependent groups include teachers' roles as learning facilitators and coaches who delegate task responsibilities to students and encourage them to be accountable for their learning (Felder & Brent, 2005).

The applications of these considerations to language learning imply the adoption of appropriate methodologies to cater for the establishment of interdependence amongst individuals. From a comparison between traditional language teaching and cooperative language learning, the beneficial effects of the latter surface as students take participatory roles in classroom dynamics, engage and collaborate with their peers on multiple levels (Zhang, 2010).

	Frontal-based language teaching	**Cooperative language learning**
Interdependence	None or negative.	Positive.
Learner roles	Passive receiver of information.	Active and autonomous participator.

Teacher roles	Controller of class pace and direction, judge of students' performances, major source of assistance, main provider of feedback.	Organiser of group work, facilitator of communication tasks, intervener to teach collaborative skills.
Type of activities	Knowledge recall and review, practice of phrasal or sentence patterns, translation and listening exercises.	Mainly group work activities to engage learners in communication, involving processes like information sharing and negotiation of meaning.
Interaction	Mainly teacher-led interactions.	Intense interactions amongst the students, less teacher-led interactions.
Room arrangement	Separate desks.	Collaborative small groups.
Students' expectations	Be either winners or losers.	Individual contributions to group success.
Teacher-student relationship	Superior or inferior.	Cooperating and equal.

Fig. 7. Reprinted from "Cooperative language learning and foreign language learning and teaching" by Y. Zhang, *Journal of Language Learning and Teaching, 1*(1), p.82.

An aspect that a comparison between the two teaching systems appears to highlight is the importance of clarifications as essential elements of learning activities; whether in frontal-based teaching or in cooperative learning methodologies, it is important for students to understand what they have to do before they can launch into action. Therefore, this becomes particularly relevant in group activities, since providing clarifications is one of the most important tasks that teachers need to undertake before expecting students to cooperatively work with other individuals.

Additional observations on cooperative language learning have revealed that better communication is likely to surface due to the interdependent nature of the actions entailed in students' relationships. The main benefits of this method for interdependence are summarised as follows:

Benefits	Descriptions	References
Maximisations of opportunities for language input and output	Negotiations, use of longer sentences, interaction-driven productions of accurate language, feedback modelling, provision of language input to others.	Ellis (1999); Jia (2003); Kagan (2000).
Creation of effective language learning environments	Creation of social and affective climates, increase in students' motivation, anxiety reduction from greater likelihood of success, increase in learner's self-confidence and self-esteem leading to greater language proficiency and academic achievements.	Stern (1992), Brown (1994); Crandall (1999); Hedge (2000); Gillies (2007).
Increasing a variety of language functions in use	Increased chances of producing functional language in context, with students involved in clarifications, making suggestions, encouraging, disagreeing and negotiating meaning. Fostered discourse control, presence of opportunities for language learning and development of social abilities.	Lightbown & Spada (1999); Çelik, Aytin, Bayram (2013).
Foster responsibility and independence	Individual accountability and shared sense of responsibility, increase in self-control and development of academic and social language.	Candy (1991); Johnson & Johnson (2005).

Fig. 8. Table summarising the benefits of interdependence for cooperative group work.

Cooperative learning may also not lead to the sought-for patterns of positive interdependence. In fact, substantial drawbacks might be constituted by potential students' disengagement from participating to collaborative activities on equal basis, with more responsibilities being shouldered by conscientious students (Thornton, 1999). Further shortcomings may appear as students become less likely to pay attention to the structures of the foreign language and use their mother tongues when the instructor is not within hearing range (Pica, 1994). However, despite these drawbacks, interdependence-based methodologies such as collaborative learning have overall contributed to the support of effective linguistic acquisition as language becomes the main channel through which individuals express and act out their goal-driven intentions.

With regards to collaborative language learning of Italian as FL, little research has been dedicated to the understanding of specific interdependence patterns amongst students involved in group work. In fact, literature has examined collaborative relationships between students for investigations in increases of language production (Tyrou & Myrkos, 2018). However, there is a substantial lack of investigation on the pragmatic implications of mutual dependence in language instruction, especially within the field of learning Italian as FL. Moreover, despite placing particular attention to the nature of relationships amongst group members, little research on cooperative learning has been applied to pragmatic educational aspects such as types of goals and tools adopted in learning contexts.

Given that interdependence is highly situational, individuals adopt goal-driven behaviours in terms of the aims they set to reach with the result that interactions give rise to behavioural dynamics. Despite the fact that inclinations are directed towards group goals, relationships entail a multiplicity of drives, aims and opinions which individuals constantly appraise and adjust to their own and mutual scopes. To deepen the analysis of collaborative learning contexts, it is therefore worth mentioning the three essential social behaviours that emerge in interdependent situations: negotiations, leader-follower relationships and goal-orientation.

1.5. Negotiations and interdependence

Negotiations are an essential part of interdependent relationships as they arise due to processes of goal attainment. Since actions targeted to specific scopes derive from compromises between parties, negotiations are divided into phases and governed by specific strategies. Fig. 9 outlines the three negotiation strategies identified in collaborative learning environments, each of which is associated to specific communicative acts (Baker, 1994; Dillenbourg & Baker, 1996). As shown below, negotiations are beneficial for interdependent learning as they are "mechanisms for achieving coordination of problem-solving and communicative actions, for achieving mutual understanding and for attaining agreement at an epistemic level" (Baker, 1994, p. 248).

Strategy	Descriptions	Communicative acts
Mutual refinement	Agents refine other people's contributions.	Offers.
Argumentation	Agents verbally resolve conflicts that are acknowledged by both parties.	Acceptance.

Stand pat	Agents provide positive/negative feedback to each other following the outline of an action proposal.	Acceptance – rejections – ratifications.

Fig. 9. Adapted from "A model for negotiation in teaching-learning dialogues" by M.J. Baker (1994), *Journal of Artificial Intelligence in Education, 5*(2), pp. 216-217.

Therefore, negotiations contribute to the creation of learning spaces where participants jointly share and construct an understanding of the task and the possibilities to accomplish it. In order to do so, Ellis (2003) identified a number of abilities that participants need to possess in order to apply the interaction strategies needed to negotiate meanings and communicate problems to the learning situations they are involved in:

- Ability to recognise the importance of other speakers' perspectives.
- Ability to take inferences into account when encoding a message.
- Ability to attend to the other speaker's feedback and to monitor output accordingly.

The communicative effectiveness reached with the application of these strategies is important for an examination of the participants' interactions arising in relation to task outcomes. However, while negotiation is a distinctive feature of collaboration since agents interact to promote learning, it only becomes interdependent-relevant when individuals coordinate problem-solving interactions and co-constructs solutions with others. While it is true that negotiations may lead to the appearance of conflicts, interdependence manifests as agents constructively solve contrasts for the sake of successful goal attainment (Dillenbourg & Baker, 1996; Johnson & Johnson, 2010). Negotiations are therefore cooperative behaviours aimed at advancing participants' interests towards mutually beneficial outcomes. The consequential interdependence arising from communicative situations can be positive or negative according to whether solutions are left undiscussed or negotiated between participants (taking roles of senders and receivers of messages).

Positive interdependence: negotiated solutions.	**Negative interdependence: non-negotiated solutions**
Other-centred solution: the sender tries to solve the problem based on the receiver's perspective as well as his own. **Self-centred solution**: the sender tries to solve the problem by making the receiver's perspective fits his own.	**Unacknowledged problem**: a problem is identified by the receiver but not acknowledged by the sender. **Abandon responsibility**: a problem is acknowledged by the sender but the responsibility for it is not taken.

	Arbitrary solution: a problem is acknowledged by the sender who solves it arbitrarily, ignoring the receiver's contribution.

Fig. 10. Adapted from "Investigating the communicative outcomes of task-based interaction" by G. Yule & M. Powers, *System, 22*(1).

Observations of interdependent patterns in business negotiations have outlined how quality of relationships changes interdependence levels between the involved parties, which in turn affects the negotiators' power structure and their selection of debating tactics. Additionally, the likelihood of reaching an agreement strengthens the interdependency bonds between the parties involved in the negotiations (Chang, 2005). Similar behavioural patterns have been reported in educational contexts, as learners actively involved in personalising a learning path within groups are more likely to accept their responsibilities and actively negotiate with their partners a set of behavioural norms and performances to reach task goals (Hod & Ben-Zvi, 2015). Therefore, it is possible to postulate that the existence of positive correlations between negotiations and goal attainment in interdependent contexts. The negotiation skills involved in this process entail careful language use and understanding of members' propositions before moving towards potential solutions.

Within the field of language education, studies conducted by Pica (1994) suggest that negotiations are beneficial to language learners as they provide students with feedback on their language use and increase linguistic adjustments and reformulations when interacting with their peers. However, negotiation processes are highly dependent upon group roles, topic knowledge and from the language proficiency of language learners. In other words, the negotiation process may differ depending on who the individuals are interacting with and whether their goal expectations match (Ramos, 2018).

While it is possible to draw assumptions related to the types of negotiations arising from interdependent groups and rooted in cooperation, investigations are missing on whether mutually dependent conditions create negotiation spaces. This is particularly relevant in language education since negotiations increase students' opportunities to apply their language skills in planning actions towards mutual goals. Actors' communicative moves in negotiations are therefore driven by the scopes that groups need to accomplish. Behaviours and emotions are triggered by negotiations as groups progress towards task aims. This consequentially affects the establishment of interdependence amongst members.

1.6. Goal-oriented interdependence

The importance of goal type in group activities is essential for interdependence to appear since individuals orient their actions according to task scopes. Therefore, goal direction is the main reason behind individual engagement in group tasks as individuals' motivation, emotions, strategies, performance and social relations change according to their scopes (Allcott, 2011; Li & Shieh, 2015). In an investigation on goal orientation, it is important to make a distinction between *outcome* and *aim*. While the former is a product of a task, the latter is its pedagogic purpose (Ellis, 2003). This implies that task outcomes may be reached without interdependent relationships surfacing amongst participants. Conversely, it is possible to design task aims attainable only as a result of joint efforts. These two definitions are of pivotal importance since they demonstrate the close relationship existing between interdependence and participants' emotional states from which types of goal direction may vary. In fact, research has outlined that performance-driven individuals are more likely to actively interact with their partners, whilst conduct-avoidant participants tend to restrain from social interactions leading to goal attainment and content learning (Borgstede, Andersson, & Johnsson, 2013). Other types of goal orientation involve participants' abilities to master activity scopes, given that participants positively engage in interactions on the basis of their learning gains upon task accomplishment and are inclined to perceive others as instrumental to reach such gains. These observations are the foundations of goal-orientation theories providing a behavioural framework for understanding interdependent patterns in students' relationships.

In educational contexts, it has been observed that individuals may display more than one type of goal-orientation. For instance, performance-driven learners with strong mastery goal tend to display positive dispositions towards group learning which entails that they will be more likely to establish positive interdependence with other group participants for an efficient task accomplishment (Broms, 2011). Within the specific field of language education, research has mainly focused on a close examination of goal-oriented tasks as means through which individuals interact with one another. In the literature, goal orientation has been observed to lead participants' behaviours towards role-assignment and norms of turn-taking (Dao, 2019). This is particularly important for group language learning which aims at making students' communicative behaviours surface in interactions. For this reason, teachers generally manipulate language activities along the communicative targets of decision-making (convergent orientation) and opinion-exchange (divergent orientation). Convergent tasks have been demonstrated to enhance turn-taking

and meaning-negotiation as well as to promote learner's collaborations and social engagement. Conversely, divergent tasks induced individuals to produce more complex language structures (Duff, 1986; Skehan, 2001; Skehan & Foster, 2001; Jackson, 2007; Dao, 2019). For the sake of an interdependence-based investigation on group goal orientations, convergent and divergent scopes are relevant since they both entail an exchange of information during interactions, making more likely a rise in instrumental perceptions of others.

An investigation on interdependence and goal orientation must therefore depart from task analysis to understand group behaviours in goal-oriented relationships. Resulting patterns of task interdependence are defined by degrees to which team members rely on and interact with one another to accomplish their tasks effectively (Campion, Medsker, & Higgs, 1993; Saavedra, Earley, & Van Dyne, 1993). Given that task interdependence relies on work organisation, its goals and characteristics, it is also "a blend of objective cues and subjective perceptions of team members' efforts to understand them" (Ramamoorthy & Flood, 2004; Drach-Zahavy & Somech, 2010, p. 150). Therefore, the effectiveness of groups towards specific goals is highly dependent on perceptions of social situations and efficiency at accomplishing successful tasks by joint efforts in co-constructing of understanding task practices. Therefore, group participants are interdependent by measure of applications of emotional and cognitive abilities. While a considerable body of literature has analysed the impact of group work on emotions and motivation in language learning, there appears to be a lack of attention to the consequences of emotional involvement in group interdependence.

Undoubtedly, goal orientation affects participants' emotions, cognitive and social engagement with consequential repercussions for group interdependence. In fact, in order to efficiently collaborate, learners must perceive a sense of fulfilment in reaching objectives as well as of ownership of task products. The persistence of these feelings throughout the learning process is more likely to lead to positive students' interdependence. In fact, research on personal fulfilment and satisfaction during group language task has reported increases in innovation, creativity, collaboration and cooperation (Moreno, 2016; Dao, 2019). However, the effects of pursuing joint goals are not uniformly positive for all participants since it is expected that some individuals might exercise more control over goal-driven pursuits than others, with the result of undermining partner's control (Van Dellen & Baker, 2011; Lowe & Haws 2014). This creates the conditions for the emergence of leadership patterns which is an additional important aspect of an analysis on positive interdependence.

1.7. Leader-follower interdependence

Task performance is profoundly affected by individual perceptions of mutual instrumentality. Individuals invest time and energy in tasks when they understand that they can reach goals by means of collective efforts. A closer examination of interdependent relationships reveals that due to the goal-driven characteristics of cooperative work, the individuals who rise to prominence are those whose actions are more likely to direct group scopes (Mercier, Higgins, & Da Costa, 2014). Instead of stifling interdependence, leadership patterns can act as enhancers of participation and confidence boosters. The mutual instrumentality arising from situations of joint goal attainment may or may not be perceived as equal between partners. In fact, one party may be more prone to follow leaders by identifying with their roles and motives, while others resist such influence either by leading or by pursuing other leaders (thus behaving as followers). While this confirms that behavioural interdependence stems from degrees of inducibility, it is also true that individuals may also switch between roles in an attempt to construct relationships based on equal responsibilities. In addition, leaders can encourage followers' independence by fostering active participation in relationships and giving rise to a process of transformational leadership (Lu, Liu, & Huang, 2020). This is made possible as members incline towards mutual income instrumentality described as a special interdependent relationship between leaders and followers.

When partners are united by a coalition of interest, they strive to maintain relationships based on reciprocity and equity achieved through negotiation and social exchange (Graen & Uhl-Bien, 1995). The relationship matrix that is consequently created implies that followers are fully aware of their roles while simultaneously being motivated to reciprocate their leaders' expectations and invest worthwhile energy and contributions in the relationships (Boer et al., 2016). These followers' behaviours surface upon condition that leaders provide support, inspire visions and expect high-performances, so that the resulting configuration of interdependence is of mutual trust, respect and obligation (Den Hartog & Belschak, 2012). In interdependent situations task performance is used by followers as a form of currency to reciprocate leaders' obligations and empowerment to trust their abilities to accomplish goals (Spreitzer, 1995). However, research in the application of leader-follower interdependence in workplaces suggests that only when followers become independently self-motivated, competent and psychologically self-sufficient may they develop interdependent relationships with their leaders (Lu, Liu & Huang, 2020; Covey, 1989). Conversely, on the leaders' side, it appears that performance-enhancing

behaviours and the establishment of interdependent relationships surface when leaders have fully assimilated followers to their values (Lu, Liu & Huang, 2020). However, if these stances are valid for workplaces, what would be the impacts of leader-follower relationships in group work in educational contexts?

Observations of leader-follower relationship patterns in educational contexts suggest that one of the prerequisites for interdependence is the acquisition of independence. In fact, individuals need to perceive a sense of agency in goal attainment processes prior to establishing interdependent relationships with them (Dubreil & Thorne, 2017). This implies that both partners must have reached existential autonomy before instrumentally engaging with others. This instrumentality implies that agent control can be exercised in forms of self-competence and goal relevance for personal motives. Consequential transpositions of perceived mastery of goal-attainment implies that only when agent control is fully established, individuals allow other people to participate. Findings therefore confirm the role played by motivation in the establishment of interdependence in group relationships.

When applying leadership theories to educational contexts, it is possible to see that leader-follower dynamics persist. However, instead of being localised in one person, in cooperative conditions every group member can lead group work activities at different moments (Gentile, 2016). According to situational contingencies, individuals may take leadership roles according to the specific skills they demonstrate to possess, only to step down from their positions when other members' attributes become more effective for task completion.

In support of the assumption that leadership may foster interdependent relationships, extensive literature has examined leader-follower relationships in business contexts (Cortellazzo, Bruni, & Zampieri, 2019; Avolio et al., 2014) In recent years, the term of *e-leader* has been introduced to describe a new profile of leaders who constantly interact with technology. In particular, e-leadership has been defined as a social influence process mediated by Advanced Information Technology (AIT) to produce a change in attitudes, feelings, thinking, behaviour, performance with individuals, groups, organizations (Avolio, Kahai & Dodge, 2000). However, little research has focused on the connections between leaders and followers from the perspective of goal-oriented interdependence in contexts of digital education. Moreover, despite the fact that digital tools are increasingly being utilised to foster learning and social inclusiveness (UN Secretary-General's High-level Panel on Digital Cooperation, 2019) the emergence of leadership patterns in support of digitally-driven interdependence still remains to be investigated in education.

1.8. Summary of limitations and gaps in the literature on interdependence applied to language learning

The main limitations of interdependence studies reside in its focus on cooperation. Therefore, investigations have examined interdependence mainly as an implication of cooperative group work whilst little consideration has been given to its role in goal attainment. Literature also appears to display an overlap between the concepts of interdependence and cooperation, instead of considering the former as a prerequisite for the latter. While a considerable amount of research on interdependence has focused on online language learning spaces, the technological resources deployed by users in interdependent relationships had mostly been based on Intelligent Computer Assisted Language Learning (ICALL). This implies that the technology used for educational purposes mainly consists in specific applications of concepts, algorithms and technology from Artificial Intelligence (AI) to language learning with technological devices (Schulze, 2010). The resulting digital resources have therefore been tailored to language instruction with adaptations from real-life materials. Therefore, further research needs to be conducted on task-based applications of digital materials not specifically made for language learning situations to verify whether these resources allow for interdependence to surface. Moreover, the establishment of an interdependence-supporting digital language learning must take into account the transient nature of online collaborations. In fact, interdependent relationships are dependent on the presence of stable Wi-Fi connections. While nowadays people generally possess Internet connections able to withstand the test of time, this availability cannot be taken for granted when devising interdependence-based language tasks. Other variables include device availability and knowledge which are aspects related to tools' utilisation potentially limiting the appearance of interdependence in online language learning.

A good amount of research in the field of interdependence has examined individual relationships arising from situational and psychological motives. However, when involved in group work, individuals engage with other participants inasmuch as with objects. In fact, the material affordances offered by learning situations are fundamental to ensure goal accomplishment and foster interactions amongst participants. Therefore, an analysis of the relationships between the objects and individuals involved in group work is of paramount importance for a comprehensive overview of interdependent group interactions. What remains to be investigated in the literature is how these behaviours are entwined within interdependent-boosting learning environments in digital spaces.

Another gap in the literature consists of few investigations on positive interdependence in online learning environment of Italian as a foreign language (FL). In fact, it becomes necessary to approach the topic from the perspective of the tools and practices applied in goal attainment. Such means are pragmatic in nature and include communication strategies and tangible objects utilised by the learners. Therefore, an analysis of interdependent behaviours in language education underlines radical changes in learning literacies which have become increasingly more evident with the development of educational technology. In sum, alternative task-based methodologies adaptable to wider learning situations need to be examined with interdependence-based investigations in language education.

CHAPTER 2. INTERDEPENDENCE-FOCUSED TASK-BASED LANGUAGE LEARNING

Investigations on group interactions have concluded that mutual instrumentality is more likely to surface when individuals are involved in cooperative activities. Therefore, cooperation has always had a central role in language education and interdependence has been treated as an exclusive parameter of social interactions. However, little consideration has been given to the fact that perceptions of mutual instrumentality depend on the type of tools and tasks utilised during group work. This has had major implications for language learning since students were found to direct their energies towards maximising tools usage to communicate with others, facilitate goal-attainment and be cognitively engrossed in linguistic tasks (Ellis, 2003; Plews & Zhao, 2010; Ingrassia, 2014). Therefore, within an analysis of interdependence, it is necessary to include pragmatic learning methodologies where interdependent behavioural patterns are more likely to arise during task-focused rather than cooperative-centred activities. Moreover, these procedures are expected to minimise potential conflicts between students and induce the establishment of trust and mutual reliance for the sake of task aims. In language education, a methodology based on these principles has been called *Task-Based Language Learning (TBLL).*

This chapter provides a theoretical overview of TBLL, its implications and suitability for the support of students' interdependence in online language learning contexts. Methodological factors including teachers and students' competences are examined with particular reference to the digital tools involved in task attainment as providers of the conditions for students to interact and construct linguistic meaning in context. Furthermore, the chapter includes an analysis of the literature on TBLL in learning environments of Italian as FL together with future directions in language education technology as a support to students' interdependence.

2.1 A methodological overview of TBLL

Task-based language learning is a student-centred methodology focused on enhancing learners' communication skills in real-life contexts. The main tenet of the method is that language is acquired through interactions and attainable through cooperative and pair work, and not by having students pay purposeful attention to language forms (Ingrassia, 2014; Birelio, Odelli & Vilagrasa, 2017). What emerges from this investigation is the importance of tasks, which Ellis (2003, p.16) defined as workplans requiring learners to

"process language pragmatically in order to achieve an outcome that could be evaluated in terms of whether the correct or appropriate propositional content had been conveyed".

Tasks are pivotal in language education since they bring attention to meaning, content, language skills and application processes of achieving task products (Hempel, 2010). Consequently, students are induced to carefully select the appropriate linguistic resources to deliver meaning with language forms in authentic situations. The resulting agency bestowed upon learners gives them freedom to choose the language forms that best enable them to reach their targets and make use of the most suitable communication channels to effectively reach outcomes. This contributes to make tasks "highly flexible and kneadable material" adaptable to situational contingencies and learners' needs (Van den Branden, 2009, p. 206). This flexibility also implies that the language included in task-based learning is holistic in nature since students use a combination of receptive and productive skills. In fact, learners involved in TBLL tasks may be required to read or listen to texts and demonstrate their understanding of them by producing written or spoken language material (Ellis, 2003; Collentine, 2010). This entails the application of cognitive processes to select, classify, order and value information which also restricts the range of usable linguistic forms whilst simultaneously allowing students to choose the suitable language structures for attaining their goals.

To attain task aims, the materials used in TBLL classes need to be authentic and applied to real-like situations and contexts. Further principles underlying this method are facilitations of the FL acquisition by ensuring individual readiness to learn a language to deliver meanings and attend to linguistic forms once the task has been understood (Ferrari & Nuzzo, 2009). Consequently, in describing TBLL methodology, it is useful to provide a sequential structure applicable in interdependent learning contexts.

As described in Fig.11, topic knowledge is elicited in an initial pre-task where students are provided with instructions. In this phase, the teacher introduces language structures and vocabulary that students might find in the activity. However, the teacher does not provide students with linguistic models to follow so that they have the freedom to choose their preferred forms to convey meaning. It is important that in this phase students are given clear instructions so that they can efficiently plan their work. The materials that students use during the task contribute to the contextualisation of the activities and stimulate students' interest and conversations. Consequently, the main focus of the pre-task is to draw students' attention to the meanings that can be conveyed with language use rather than with form. Focus on meaning is also central in the subsequent three-phased task cycle of the TBLL methodology. Firstly, students are divided in pairs or groups and

work on the assigned task under the teacher's supervision. Subsequently, they plan and present their work and what they have discovered while the teacher monitors the process. In the last phase, groups share their reports with the class and attend to the linguistic forms they have utilised by discussing and practicing specific language features under the teacher's guidance.

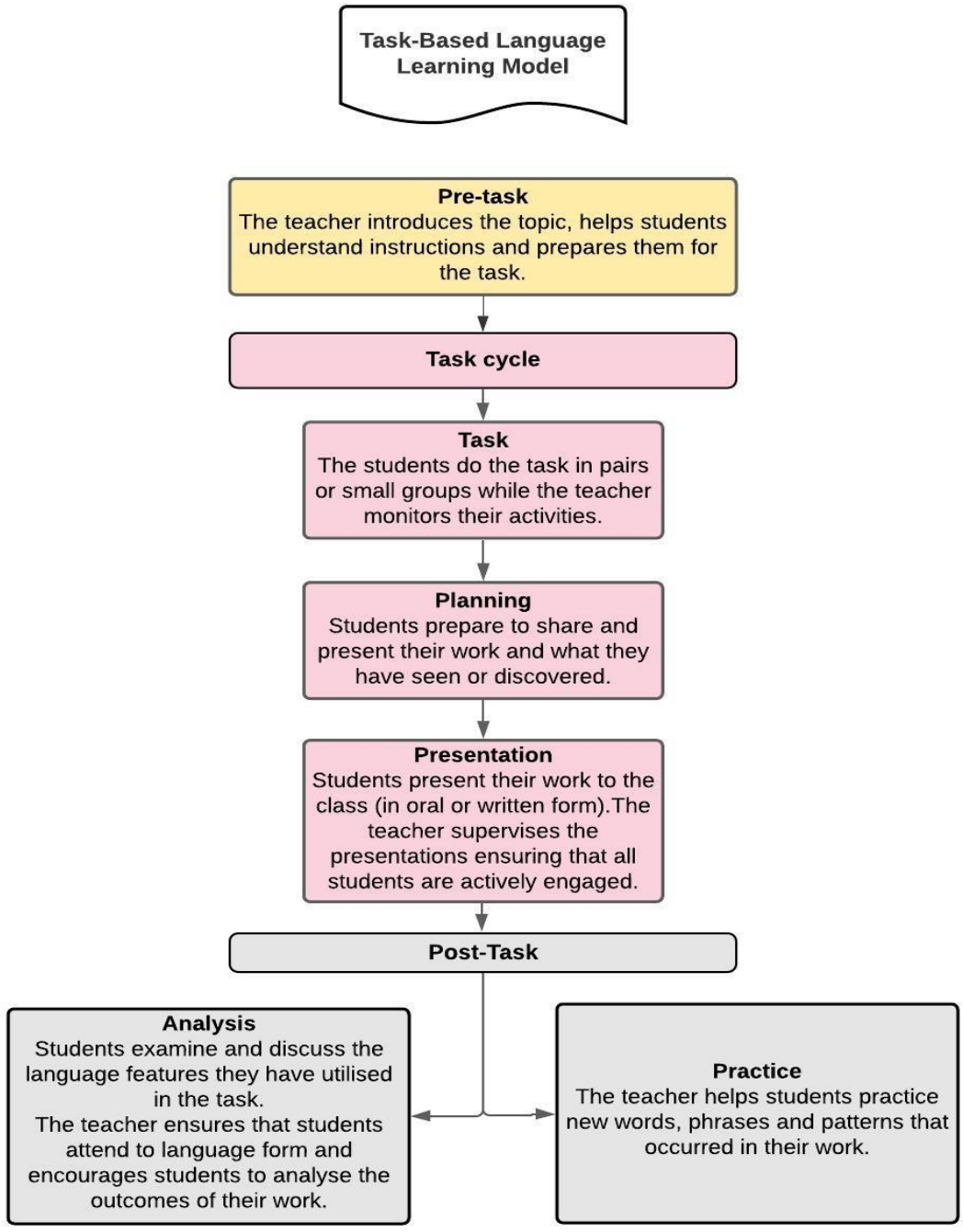

Fig. 11. Adapted from *A framework for task-based learning* by J. Willis (1996). Essex, UK: Longman.

2.2 Task-based learning: an interdependence-based overview

TBLL has been shown to affect the ways in which people engage in task activities and with one another. In fact, the combination of skills and discourse possibilities made available during task interactions are targeted to non-linguistic goals which in turn make interdependence surface in group dynamics. Individuals split their attention between language form and use in a continuum where they simultaneously communicate and reflect on their actions (Bange, 1992). However, Plews and Zhao (2010) indicated that the presence of interdependence is conditioned by a number of aspects which need to be adopted by students and teachers in TBLL contexts (Fig.12).

Students	Teachers
Students require exposure to real, authentic and comprehensible language.	Teachers ensure that the activities are interconnected and organised with specified objectives to promote students' willingness to learn.
Students are situated in learning conditions permitting unrehearsed and spontaneous language use.	Teachers plan activities helping students notice and discover linguistic forms and reason inductively.
Students are situated in language learning conditions permitting purposeful interactions where they take informed risks, make choices and negotiate meanings while seeking solutions to queries.	Teachers design language activities where language skills (listening, speaking, reading and writing) are integrated, elicit self-correction and personalised feedback.

Fig. 12. Adapted from "Tinkering with tasks knows no bounds: ESL Teachers' Adaptations of Task-Based Language Teaching" by J.L. Plews & K. Zhao (2010), *TESL Canada Journal*.

Once the abovementioned features have been met, learners become social actors using their linguistic competences to collaboratively co-construct meanings (Birelio, Odelli & Vilagrasa, 2017). Consequently, tasks become socially plausible acts with stimulating language activities where students interact with and mutually depend on each other. Since interactions are meaning mediations where speakers convey a message both linguistically and conceptually, speakers assist one another in performing functions in which they are not able to act alone (Canale & Swain, 1980; Ellis, 2003). In this way, learners can perceive the added value of others while jointly proceeding towards non-linguistic goals.

The high plausibility of tasks enabled by the presence of these features implies that learners interact with their peers and tools just as if they were immersed in real-world

situations outside of educational contexts (Long, 1985; Mangenot & Penilla, 2009). Tasks therefore create authentic opportunities for students to socially interact, increase their motivation, foster the expendability of learning content in the real world, exchange opinions and negotiate meanings with others. Therefore, the creation of these shared communication spaces comparable to real-life interactions outside of the classroom constitutes the link between TBLL and technology.

2.3 TBLL and technology

Designing TBLL activities with technology takes into account the gradual development of students' autonomy with highly structured individual activities evolving into collaborative tasks where technological tools are progressively integrated to cater for different levels of language proficiency and learning styles (Hampel, 2010; Hauck, 2010). Within an analysis of interdependence, the resulting framework for designing effecting online TBLL must take into account structures, learning styles and technological affordances (Fig.13).

Design feature	Description	Online realisation
Goal	Generalised task purpose.	Oriented to the development of communicative skills through language use and interactions, sense of community and e-literacy.
Task types	Types of tasks involving multiple skills.	Mixed, interactive tasks of information gathering and sharing, ranging from simple information gaps to complex role-plays and simulations, from puzzles and games to everyday service encounters. Tasks must compensate for a lack of interactions and be as interactive as possible.

Input	The verbal or non-verbal information supplied by the task.	Mixed input genres (websites, articles, surveys, presentations). Variations in modality (written, visual and audio).
Conditions	The ways in which information is presented.	Shared information and distributed activities for cooperation and collaborations.
Cognitive complexity	Participants perform cognitively simple or complex constructs while doing a task.	Variations from lower cognitive complexity in web searchers to higher complexity in discussions, collaborative knowledge-building activities and use of digital platforms (*ZOOM*, Web 2.0).
Linguistic complexity	Complexity depending on language frequency and saliency.	Appropriate complexity to language level.
Procedures	Methodological procedures followed when performing the task.	Individual and group activities with linear progressions and specific task timings.
Predicted outcomes	The product resulting from task completion.	Construction of new information and knowledge, enhanced discussions, sharing of information and experiences. Interactions meant to favour perceptions of a sense of community.
Process	The linguistic and cognitive processes the tasks can generate.	Higher-order mental processes, increased usage of language forms for various communicative purposes (such as discussing, describing, commenting).
Teacher factors	Different task roles for teachers and type of support given to learners.	Limited teacher task roles as they only give encouragement and support.

Learner factors	Different task roles for learners and individual learning styles.	Mix of roles and range of tasks catering for individual learning styles.

Fig. 13. Adapted from *Task Design for a Virtual Learning Environment in a Distance Language Course* by R. Hempel (2010), London, UK: Continuum Publishing Group, pp. 141-147.

With its focus on tasks, TBLL with technology implies an action-oriented learning approach providing users with opportunities to co-act in learning environments at the crossroad between the classroom and the outside world (Ollivier, 2016). Therefore, authenticity is enhanced by the incorporation of learning tools making tasks correspond to real-world activities (Long, 1985). Tool types may vary and evolve according to the mutating nature of learning environments. In fact, the more real-like and not-school-constructed the environments are, the more learning spaces evolve together with the tools necessary to attain task scopes. Consequently, tool authenticity has inevitable repercussions for the levels of interdependence between interacting students and the types of literacies required to participate in the tasks.

2.4 Multiliteracies and e-literacy in TBLL with technology

TBLL enables students to pragmatically acquire language by participating to learning communities. Therefore, it is the most suitable methodology preparing individuals to live in complex and evolving societies. It also accounts for the "burgeoning variety of text forms associated with information and multimedia technologies" (Cazden et al., 1996, p. 61). This methodology fosters interdependence through the use of electronically-mediated communication tools supporting social interactions, dialogues, debates and intercultural exchange (Hauck, 2010). Therefore, the type of pedagogical literacy supported by TBLL can be defined as a form of new media education, which is participatory and multimodal. The types of literacies emerging from this scenario are highly pragmatic and incorporate "supple, variable communication strategies, ever divergent according to the cultures and social languages of technologies and functional groups" (Cope & Kalantzis, 2009, p.170). A pre-requisite of TBLL with technology is e-literacy, defined as a possession of "skillsets necessary for students to engage effectively in contemporary communication" (Pegrum, 2009, p. 36). In fact, only when students have sufficient technological know-how can they fully participate in interaction-based online learning environments. Attendance surfaces as students contribute to social networking and take part to virtual worlds and games. Consequently, the kind of literacy involved in e-learning is multimodal,

comprising media competences with which students design learning materials and interact with others to accomplish joint goals (Cazden, Cope & Fairclough, 1996; Pegrum, 2009; Hauck, 2010). Therefore, resource design implies that students are involved in metalinguistic conversations and talk about the type of language needed to reach their targets. This stimulates students' cognitive reflection and provides flexible opportunities for discourse to arise. However, interdependence is contingent to device utilisation. This is why tools are instruments through which students exercise their agency to take part in highly-demanding cognitive tasks and are accountable for their participations in interactions (Hampel & Hauck, 2006). An assessment of the impact of tools on students' interdependence must therefore depart from investigations on the relevance of devices for linguistic learning. In fact, within this framework, communication tools become mediating factors influencing language development.

2.5 The role of tools in interdependent relationships

If we posit that instrumentality is targeted towards goals, it is also true that participants need to deploy tools which are incorporated in interactions to increase opportunities of goal attainment (Overdijk, van Diggelen, Krishner, & Baker, 2012). However, it is also true that the nature of the tools involved in group interactions influences the type and strength of interdependent relationships between individuals. Given that digital tools are increasingly replacing material artefacts in multiple sectors, an analysis of educational devices has important implications for students' interdependent relationships.

Tools are instructional materials which can be used by educators to illustrate concepts and help students reach their targets. Additionally, they may constitute learning contents as users discover how to use artefacts for their scopes. In other words, tools amplify human capabilities to reach targets by "extending sense organs and the range of materials used for conveying messages through the same organ" (Amadioha, 2009). Moreover, by expanding the range of communicative possibilities to convey messages, tools facilitate interactions and encourage active communication between the two parties exchanging and sharing ideas (Cerratto Pargman, Nouri, & Milrad, 2017).

Given their dependence from methodologies and learning scopes, the tools adopted in language education have evolved with learning methodologies. From frontal-based language instruction where teachers utilised chalkboards, handouts, slide projectors, motion pictures and audio materials, learning tools have grown to be increasingly more digital and tailored to student-centred instruction. In fact, tools can be adapted to goal types,

learning styles and activity scopes, be based on technology or consist of traditional materials. Therefore, the versatility and applicability of these tools to real-world tasks makes them suitable for educational contexts of TBLL.

On this matter, the increasing development of digital tools in learning contexts may lead to the progressive incorporation of digital and interactive devices in language education. This tendency has surged in response to the outbreak of Covid-19 as language learning and teaching have been entirely transformed into remote activities. Confronted with the challenges of fostering students' engagement and interactions in virtual environments, language teachers have increasingly adopted technology in their methodologies. In contexts of TBLL learning, this implied a strong link between task and tools, so that the efforts directed to attaining one could not be separated from the full use of the other. Consequently, it can be assumed that participants' mutual instrumentality depends from how they exploit the affordances of digital tools to reach their task goals. As a result, language learning is the product of interactions triggered by tasks and digital tools use. From these considerations, it appears that online language learning surfaces from the close relationship between devices and participants' interactions.

One of the main characteristics of tools is that they act as mediators between individuals and task contents (Thorne, 2018). In fact, students emotionally experience devices together with their "properties and meanings, as well as their evolutions resulting from the subjects' actions" (Cerratto Pargman, Nouri, & Milrad, 2017, p.229). The significance of tools for interdependent learning can therefore be understood in terms of students' perceptions of target usefulness and correspondence to e-learning abilities. Once these factors are in place, students can utilise digital tools to participate in learning communities and utilise devices to shape and modify their final goals. Consequently, the more comfortable the students are with learning tools, the more they will establish positive interdependent relationships with other group members to successfully reach their targets (Lin & Laffey, 2006). However, the relevance of tools for interdependent learning environments is subject to some conditions as well as to an understanding of their possibilities and drawbacks by the students.

Firstly, tools are means to reach targets, not the aims of language education (Balboni, 2017). In order words, they do not substitute for goal attainment but facilitate it. Therefore, the type of target determines the nature of the tools used for learning purposes. This has implications for the levels of interdependence established between teachers and learners since tools contribute to shape the environment where individuals are immersed in. In particular, instructors should carefully think about the tools participants use during

the TBLL activities, since students' quality of interdependent relationships and group effectiveness to reach task goals depends from devices' utilisation. Moreover, teachers become instrumental for students as they provide guidance on the tools to deploy for activities' completion (Nam, 2008). Only when these conditions are in place the creation of students' positive interdependence is facilitated. Therefore, multiple factors need to be considered by teachers when deciding the tools to integrate in the language classroom for students' goal-attainment processes. In fact, research in the field of digital tools applied to online learning has outlined some of the criteria which teachers can follow when selecting the devices ensuring interactive students' participation (Cerratto Pargman, Nouri, & Milrad, 2017; Raith & Hegelheimer, 2010; Müller-Hartmann & Schocker-v. Ditfurth, 2010; Ingrassia, 2014; Ally, 2019):

- Correspondence to students' interest and facilitations of goals to reach.
- Multi-user nature of operating systems.
- Low complexity so that instructional time is minimal.
- Ease of accessibility provided availability of Wi-Fi connection.
- Captivating design and engaging structure fostering students' motivation levels during the activity.
- Allowance for a gradual introduction of task tools as complexity increases.
- Easy retrieval from tools' distribution across sites and platforms.

Such conditions are available when teachers possess the digital competences of how to apply technology in an appropriate fashion to a given set of learning goals (Albrahim, 2020; Ally, 2019; Falloon, 2020). Specifically, by deploying technical skills to select and create digital tools in TBLL contexts, teachers become facilitators of students' interdependence and language acquisition since they contribute to develop learners' agency and mutual efforts to reach task goals. Some of the teachers' technical competences fostering students' interdependence have been outlined in Fig.14.

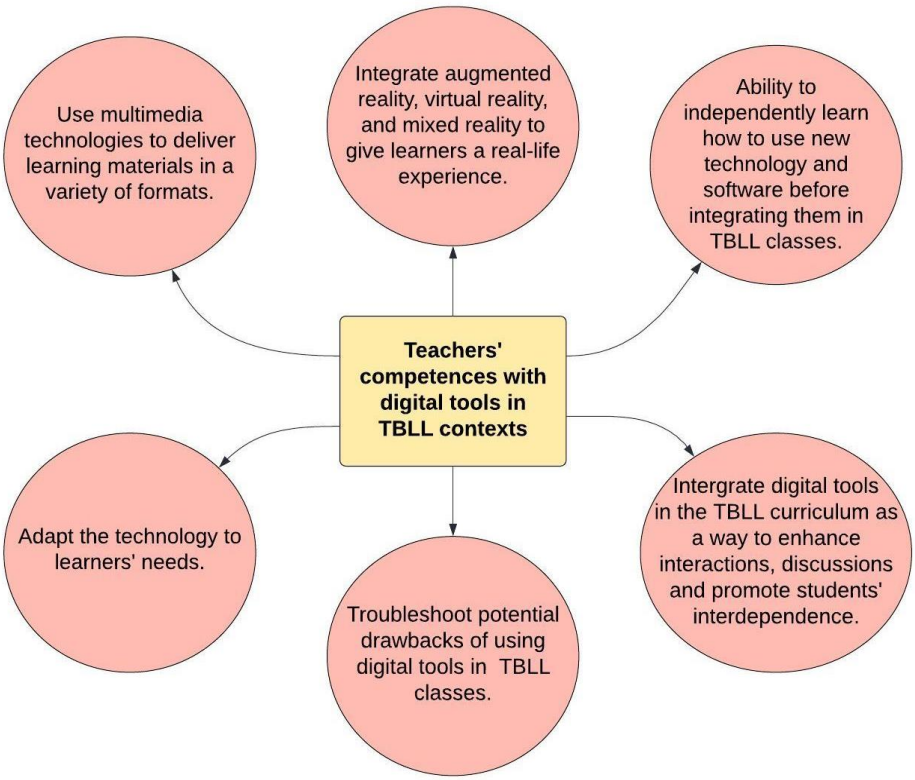

Fig. 14. Adapted from "Competency Profile of the Digital and Online Teacher in Future Education" by M. Ally, *International Review of Research in Open and Distributed Learning, 20*(2), p.309

With regards to students, interdependent relationships are established on the basis of the type of tools used to reach task goals and knowledge of how to use them. Therefore, when analysing learners' interdependence in TBLL contexts, considerations must be given to the fact that digital tools can be acted upon and modified according to goal-driven motives (Pegrum, 2009). In other words, by using devices, students become designers of their learning paths. This ability may not be solely dependent on teachers' instructions, since the online distribution of digital resources is so vast that learners need to learn how to source and use them as they proceed in language activities (Pegrum, 2009; Stockwell, 2010). Therefore, to jointly progress towards goal attainment and negotiate meanings within their groups, learners orient their interactions according to tools' availability. Consequentially, levels of learners' engagement are dependent upon devices as interactions surface in subject-subject and subject-object relationships with their peers and teachers (Cerratto Pargman, Nouri, & Milrad, 2017). To ensure the establishment and endurance of interdependent relationships, tools must in turn captivate and nurture users' attention throughout the goal attainment process with design and functioning affordances outweighing device constraints and allowing for adaptability to classroom use (Longchamp, 2012). In fact, if tools are sufficiently versatile and malleable to activity development and group utilisations, users can understand the transformation potential of objects

and language learning becomes more permanent since it is linked to enriching real-like experiences (Amadioha, 2009). Additional benefits for students' positive interdependence with digital tools utilisation are connections between institutions and communities outside of the university which strengthen group relationships and facilitate learning processes (Dubreil & Thorne, 2017). The conditions for students to establish mutual positive interdependence depend on tools' utilisation and have been outlined in Fig. 15.

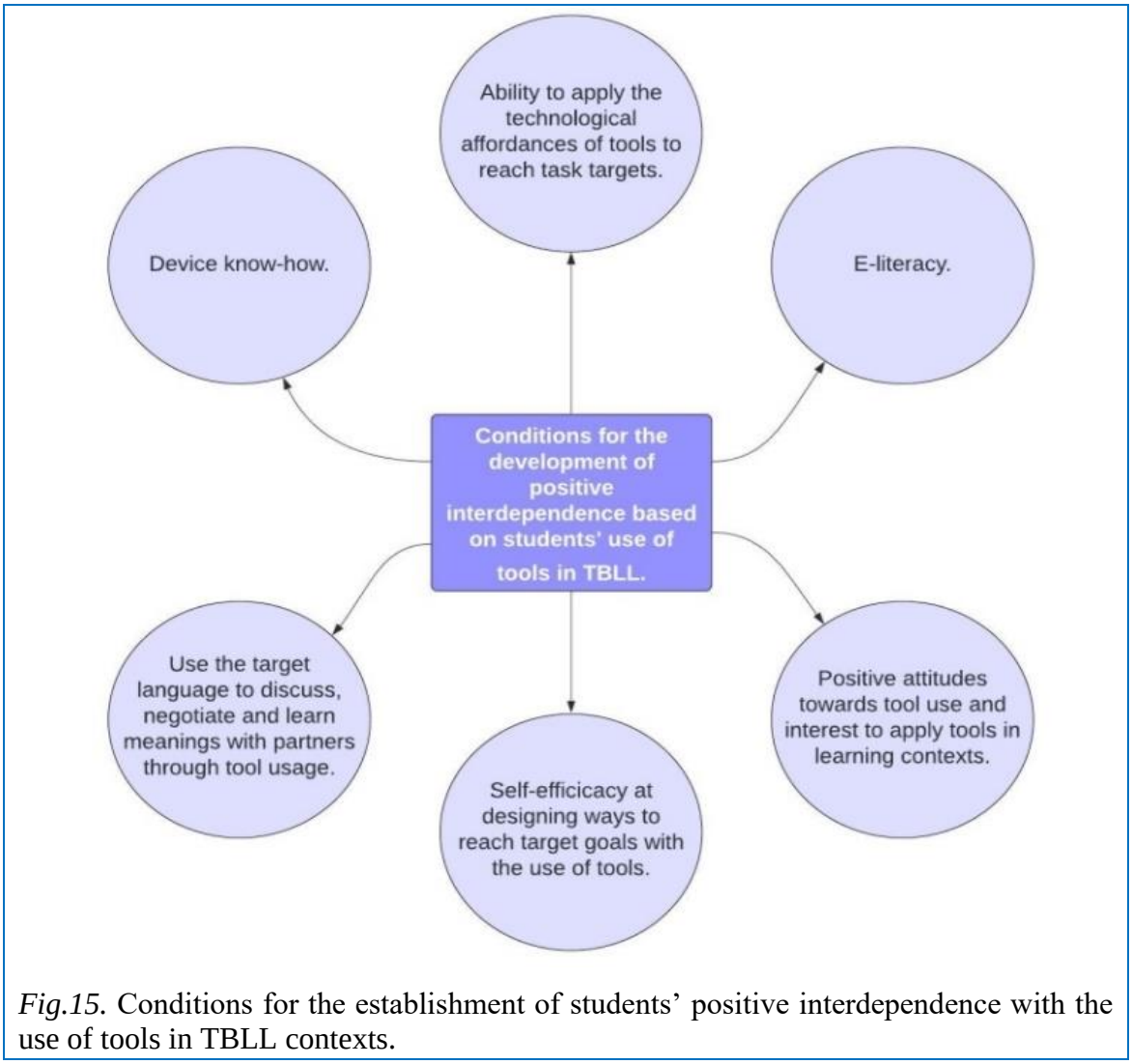

Fig.15. Conditions for the establishment of students' positive interdependence with the use of tools in TBLL contexts.

From the analysis above, it appears that the successful establishment of positive interdependent relationships though the utilisation of digital tools in TBLL classrooms is dependent upon a number of factors including teachers' and students' abilities as well as tools instrumentality and usefulness to task accomplishment. What has also emerged from the analysis is that TBLL with technology appears to be efficient for language learning since students perceive the relevance of what they learn, personalise content and co-construct it with others. In other words, digital tools become facilitators of language acquisition since they create equal opportunities to learn, allow for personalisation and enable contextualisation of content and language into real-world activities. However, although researchers have widely investigated potential applications of digital tools in language

learning environments, research on utilisations of digital tools in TBLL supporting students' positive interdependence is considerably scarce. This is particularly true for contexts of learning Italian as a FL in online environments.

2.6 TBLL with Italian as FL

While extensive literature has been produced in TBLL applied to teaching English to speakers of other languages (ESOL), little research has been dedicated to its applications in Italian language learning. In fact, studies have focused on understanding students' perceptions of TBLL methodologies and their effects on language acquisition rather than investigating their impacts on interactions and interdependence (Ingrassia, 2014; Rossi, 2016). Overall, findings reported good levels of students' satisfaction with the method as it boosted their language skills. However, little has been mentioned about learners' level of social engagement and participation in goal-centred interactions. This implies that an analysis of students' interdependence in Italian as FL is a potentially new field of investigation, especially if applied to digital learning contexts.

Studies on Mandarin speakers learning Italian in TBLL contexts in their home countries and in Italy have reported negative correlations between TBLL tasks and student's willingness to work cooperatively (Ingrassia, 2014; Rossi, 2016). As reported by Ingrassia (2014) and Rossi (2016), this may be related to students not being used to cooperatively interact during language classes due to prior exposure to frontal teaching methodologies. Hence the importance of not taking for granted students' readiness and willingness to interact when investigating interdependent relationships. Another aspect which has emerged from the literature on learning Italian as FL is related to teachers' lack of preparation in applying TBLL methodologies to their language classes, which may considerably affect the establishment of interdependence amongst students. This is why an investigation on educational technology and virtual resources tailored to language learning deserves further investigations. Therefore, it is vital that for the creation of positive interdependence students and teachers involved in online language classes possess knowledge of the affordances of digital tools from interactional perspectives as well as of the digital environment where learning takes place.

2.7 Gaps in the literature and future directions

This chapter has provided evidence that TBLL efficiently supports target-oriented interactions aimed at language learning. However, research on sustainable digital applications fostering students' interdependent relationships is missing from the literature. Therefore, it would be important to fill this gap with additional investigations on TBLL in online educational contexts, since interdependent behaviours are essential to maximise interaction potentials and stimulate task completion and language acquisition. Given the steady evolution of virtual resources, research on efficient TBLL environments supporting students' e-literacy and interdependent behaviours would also contribute to the development of student's interactional adaptability to increasingly digital language learning environments.

CHAPTER 3. AN INTERDEPENDENCE-BASED REVIEW OF EDUCATIONAL TECHNOLOGY AND VIRTUAL TOOLS

In recent years, technology has quickly evolved to permeate many aspects of human lives. The exponential growth in capabilities to collect, store, retrieve, disseminate information and new knowledge has unprecedently expanded individual chances to interact and connect (Redondo, 2015). In fact, online communication channels have transcended organic ones and human beings have evolved to communicate with digital tools across physical distances, to the point that social interactions have increasingly become routinised digital mediations (Thorne, 2016). Multiple professional sectors have benefited from applications of technology which are being constantly developed to improve existing practices and create new ones. The education field has not been exempted from such influences. In fact, it has been reported that:

Second and foreign language researchers and educators have long recognised the potential of digital technologies to provide access to input, practice and rehearsal (audio recordings, video, tutorials, drills, mini games), amplify possibilities for meaningful and creative expression (text and media processing), to extend existing and create new opportunities for interpersonal communication (synchronous and asynchronous messaging, online intercultural exchange), to collaborate in linguistically rich multiparty interactions and to construct relevant presentations of self in digital media environments. (Thorne, 2016, p.241)

What emerges from this passage is that language education is a function and consequence of social life, dependent on learners' environmental manipulations. Technology becomes therefore a resource to foster access to education and contribute to the social activities of learning processes (Bruce & Levin, 1997; Morchid, 2020). Consequently, an analysis on students' interdependence cannot be separated from investigations on educational technology. In fact, with the increasing availability of technological devices at relatively affordable costs, the diffusion of domestic and wireless Internet connection and the numerous benefits of digital tools for interpersonal communication, language education is increasingly becoming technology-based. It is therefore essential to examine the implications of digital interactions for students' interdependence in online language learning with reference to recent innovations in language education. This is why this chapter investigates existing literature in the field of language learning with technology including virtual communication platforms and Extended Reality (XR). Applications of digital platforms are analysed in school-related contexts and museums which have adopted virtual

resources to engage audiences in learning experiences and which could be incorporated in online language classrooms to incentivise students' positive interdependence.

3.1 Educational technology: virtual environments and online social presence

Evolution and adaptability are key features which make language learning adaptable to environmental, social and cultural factors (Morchid, 2020). The link between education and technology is therefore the result of adaptations of the former to the requirements of a reality increasingly incorporating digital resources. Therefore, investigations on the nature of educational technology are important for an analysis of interdependence in learning contexts.

Since its inception in the 1960s with pioneering work from academics in the United States, computers have been extensively applied in language education (Kemeny & Kurtz, 1981; Hart, 1981). Some technological assets include (Bruce & Levin, 1997; Lakhana, 2014; Gazi, Aksal, & Menemenci, 2013):

- Enhancement of motivation, engagement and communication.
- Freedom to learn languages anytime and anywhere with mobile learning.
- Digitally-situated language learning resembling real-life activities.
- Technological support to goal-orientation and quantifiable gains.
- Realisation of abstract knowledge in the physical world.
- Enhancement of individual agency to impact the digital environment where learning is located.
- Improvement of group collaboration.
- Addition of authenticity to language learning experiences.
- Enhancement of freedom of expression and opportunities of knowledge acquisition.
- Ability to perform complex thinking, recognise connections and possess self-discipline and organisation.

The success of these gains in language learning has given rise to the approach known as Computer-Assisted Language Learning (CALL) which has entailed the creation of open learning spaces where communication potentials are amplified by multiple opportunities of information-sharing. This raised the necessity of incorporating technological practices within appropriate interdependence-supporting methodologies and of language learning environments promoting students' interactions towards educational goals.

Situational components became therefore of pivotal importance in generating the conditions for the creation of interdependent relationships amongst the students participating to language learning activities. Given that learning environments influence students' opportunities to practice language and interact with others, an analysis of interdependence must depart from the environmental affordances made available by digital educational spaces.

An investigation of positive interdependence in digital environments is informed by theories of affordances (Blin, 2016) since technological spaces create agentive opportunities for human actions and interaction possibilities. Blin (2016) added that in online communities, students manipulate and design virtual materials to reach linguistic goals, appraise and value affordances according to situation usability and usefulness. In virtual learning spaces, affordance theories extend to the virtual environments where students are immersed in. In fact, online spaces are adaptable to participants' interactions, expandable according to an interaction network permitting virtually unlimited action possibilities. These are the affordances of a social web (known as *Web 2.0*) where information is accessed, modified, created and shared by users (O'Reilly, 2004). As a result, users have the ability to express themselves, be in control of what they produce in the digital reality of the Internet, share and discuss their outputs with a virtually unlimited network of people (Delgado, 2019). With the evolution of online social spaces, environmental affordances for language learning have expanded to the point that devices have become able to read, collate and integrate information, give intelligent responses to users' questions and customise information and notifications to their needs (Pegrum, 2017). This has created what has become known as *Web 3.0*, a geospatial web of 3D graphics including XR reality and gaming environments (Mitra, 2019). This type of ever-evolving web enables the search, identification and sharing of information which is simultaneously linked to immersive real-life environments. The principle underpinning XR is that the familiarity and resemblance of virtual immersive spaces to authentic situations stimulate users to act online as if they were located in the real world and makes them comfortably interact with others. Therefore, while the evolution of learning spaces has expanded possibilities for students to interact, it has also led to changes in perceptions of mutual relationships.

Within the educational field, social behaviours surface with high perceptions of comfort, security, acceptance and equity in learning environments (Obaki, 2017). On this matter, research in online learning has demonstrated that individuals communicate in a more relaxed and stress-free atmosphere than in the traditional language classroom. In particular, it has been observed that in virtual environments students tend to display less social anxiety and low levels of inhibition (Roed, 2003; Muñoz-Cantero, García-Mira, &

López-Chao, 2016). Therefore, given that language literacy is highly situational, it can be assumed that online spaces have major impacts on students' interdependent relationships causing changes in perceptual behaviours. In fact, when analysing computer-mediated communication from the point of view of social interactions, users have the tendency to perceive each other realistically through the use of computers as mediums, a phenomenon called *social presence*. This concept has been defined as the sense of being with another (Oh, Bailenson, & Welch, 2018), a "feeling of being there with a real person, which is a crucial component of interactions that take place in virtual reality" (Biocca, Harms & Burgoon, 2003, p. 456). This description offers a framework for maximisations of online exchanges through increased awareness of language use, social interactions and feelings of belonging to learning communities. It also strengthens the importance of creating virtual connections and cultivating relationships which increases student motivation and elevates learning outcomes (Whiteside, 2021). The model's parameters have been represented in Fig. 15 and are influential for online social presence in language education environments. They have been described as:

- **Affective association**: emotional connections such as humour, paralanguage, and self-disclosure.
- **Community cohesion**: degree to which participants perceive learning groups as communities.
- **Interaction intensity**: measure of interaction levels amongst participants.
- **Knowledge and experience**: students' sharing of additional resources and experiences.
- **Instructor investment**: levels of teachers' activities and participation to learning communities.

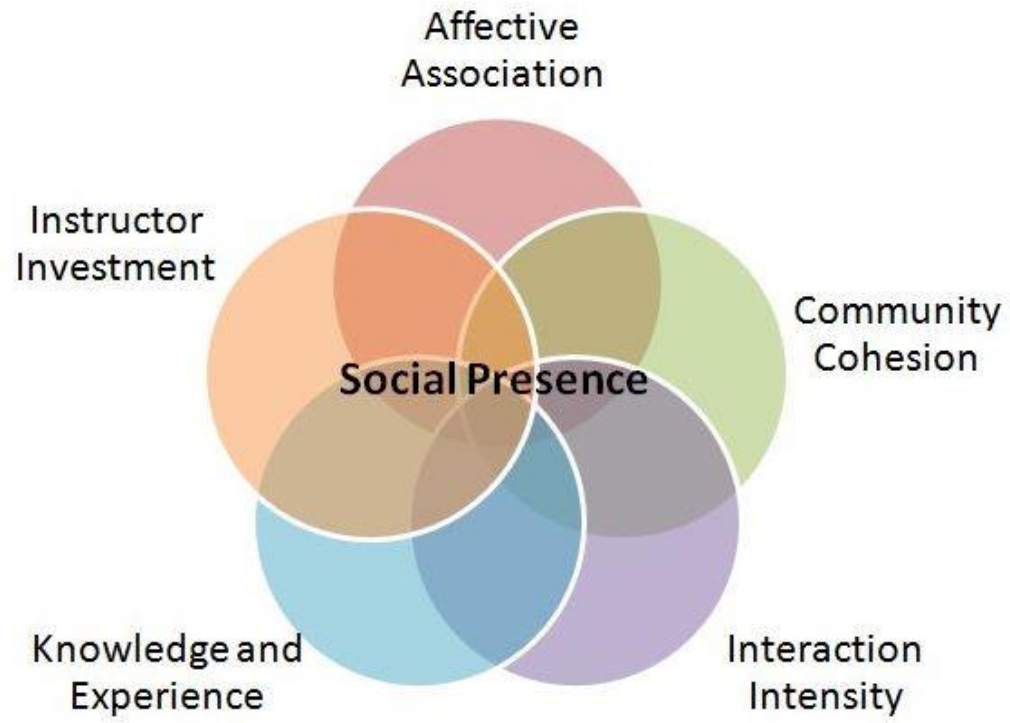

Fig. 16. Reprinted from: "Integrating the Social Presence Model to Maximize Blended and Online Learning Experiences" by A.L. Whiteside (2021), Copyright 2021 Online Learning Consortium.

These considerations imply that social presence can be influenced by contextual and individual factors impacting perceptions of the psychological distance between interactants (Siriaraya & Ang, 2012). Consequently, the model highlights that the two main elements influencing social presence are communication contexts and the individual traits of the interactants (Oh, Bailenson & Welch, 2018). It also describes the situations and modalities with which virtual immersions induce stronger feelings of social presence and demonstrates that the link between it and social interactions is represented by the qualities of relationships. In fact, the connections established between participants of virtual activities are definable in terms of degrees of interactivity, trustworthiness, immediacy and intimacy of interactions. These are the same dimensions indicating intensities of interaction and non-verbal communication conveyed through eye contact, physical proximity and facial expressions in the real world (Cooke, 2007; Kozuh et al., 2015). Therefore, it can be said that associations between students' interactions and social presence confirm the important role of interdependence in digital language education. However, it is also true that students may participate in online language learning in ways that differ according to the levels of social perceptions and technological readiness. This is why it is useful to describe different types of students' virtual presence and their relevance for positive interdependence in language learning environments.

3.2 Immersion and social presence in interdependent online learning spaces

The array of emotions perceivable by learners in immersive virtual spaces entails differences in the types and intensity of relationships they establish with other individuals in participatory online activities. Consequently, degrees of interdependence are also affected. For this reason, it is useful to distinguish *presence* from *immersion* and understand the differences between the technological qualities and psychological experiences afforded by mediated communication (Oh, Bailenson & Welch, 2018). Immersion is defined as a medium's technological capacity to generate realistic experiences that can make people perceive that they are present in a nonphysical yet culturally authentic environment (Blyth, 2017; Oliva & Pollastrini, 1995). This concept is measurable in terms of technological affordances such as audio and visual quality, frame rate and field of view (Slater & Wilbur, 1997; Cummings & Bailenson, 2016). Therefore, devices are immersive when they provide "an inclusive, extensive, surrounding and vivid illusion of reality to the senses of a human participant" (Slater & Wilbur, 1997, p. 604). In contrast, presence is the experience of being in the mediated virtual environment and can be described in terms of *telepresence* and *self-presence* (Slater & Wilbur, 1997). While *telepresence* refers to "how vividly users experience the environmental and spatial properties of the mediated environment" (Oh, Bailenson & Welch, 2018), *self-presence* refers to how connected individuals feel to their virtual bodies, emotions, or identity and to how they share digital spaces with their interlocutors (Blyth, 2017; Ratan & Hasler, 2009). When applied to language education, these concepts assume a vital role in describing students' interdependence. In fact, learners shape their interdependent interactions in virtual spaces on the basis of perceptions of themselves and of others. Given that language learning depends from students' social engagement in activities, immersion and social presence constitute the foundations of XR applications. However, these concepts have not been specifically addressed in the literature on interdependence in linguistic learning. Conversely, numerous interventions have been carried out on the use of XR technology in language education due to the new skills that they enabled students to develop, such as sense-making, novel and adaptive thinking, social intelligence, new media literacy and virtual collaboration (Davis, Fidler, & Gorbis, 2011). This research focus can cast light on levels of students' interdependence by analysing individual and social engagements as targets of educational technology.

3.3 XR and its benefits for social engagement

The technological advancements of language education have transformed learning in an immersive and engaging digital experience. The overarching term of XR comprises the technological systems and applications of Augmented Reality (AR), Virtual Reality (VR) and Mixed Reality (MR), which have been introduced in interactive language learning. AR refers to the integration of digital media and images in physical spaces with technological devices (Perry, 2015; Reilhac, 2020). Therefore, whilst being allowed to be perceptually located in their physical world, users shift their attention to their devices presenting digitally added information to reality (Segura et. al, 2020). As a result, AR experiences can "move or animate but they might not interact with changes in depth of view or external light conditions (Ziker, Truman & Dodds, 2021, p. 56). The suitability of this technology for mobile language learning is enhanced by its portability, geolocation, context sensitivity and mostly free accessibility (Klopfer, 2008). An AR feature which has been successfully applied for gaming and educational purposes is markerless AR, which refers to "a software application that doesn't require prior knowledge of a user's environment to overlay virtual 3D content into a scene and hold it to a fixed point in space" (Schechter, 2020). This type of technology is usually available on a mobile phones and tablets as part of downloadable applications. For instance, the platform *Google Arts & Culture* utilised in this study integrates markerless AR in the feature of *Art Projector,* enabling users to virtually hang life-sized artwork inside of their homes and see the results on their devices ("Six Things to Do with Your Camera Phone at Home", 2021). Conversely, VR refers to immersive experiences in computer-generated environments made possible by the use of interfaces allowing users to interact with models of the real world (Eichenberg, 2012). In this process, individuals are often prevented from interacting with reality by being immersed in a virtual one which becomes their only perceivable environment (Ziker, Truman & Dodds, 2021). A subset of VR is constituted by inherently social and collaborative Virtual Worlds (VW). While VR is an episodic virtual experience ending with task accomplishment, VW continue to exist in computer servers and remains at the students' disposal for whenever the learning activity is initiated (Bell, 2008). Both VR and AR can be combined in MR environments where aspects of both technologies are merged by means of a single type of device ("What is AR, VR, MR, XR, 360?", 2021). They include an interplay of technology and motion sensors, body and eye-tracking, providing users with a richer and fuller version of reality. For instance, MR may add sounds or graphics to real-time experiences (Ziker. Truman & Dodds, 2021). Therefore, various types of XR activities can be located along a continuum between reality and virtuality which Scrivner et al. (2018) described in terms of degrees of students' immersion

in educational activities (Fig. 17). Applications may be created, modified and utilised along this continuum according to students' engagement levels and interactional benefits achievable during task activities.

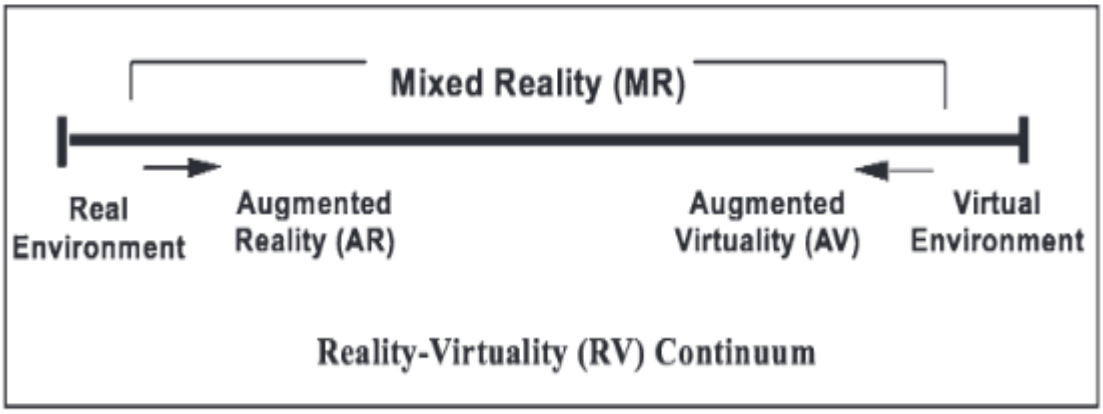

Fig. 17. Reprinted from "Best Practices in the Use of Augmented and Virtual Reality Technologies for SLA: Design, Implementation, and Feedback" by Scrivner et al. (2018) In: M. Carrió-Pastor (Ed.), *Teaching Language and Teaching Literature in Virtual Environments* (p. 58).

Technological development in higher education has enabled the creation of sustainable educational technologies supporting users' interactions and content retention. In fact, one of the main positive effects generated by all types of XR on learning enhancement includes words-images associations and mental representations of learnable content (Mayer, 2020). Another benefit is granting content access to students with limited possibilities of attending in-person classes (Bucea-Manea-Țonis et al., 2020; Ziker, Truman, & Dodds, 2021). Moreover, whilst in synchronous teaching modalities XR immerses students in educational experiences resembling in-person class attendances, in cases of asynchronous learning it enhances personalisation and bridges the experiential gap between educational institutions and the outside world.

A good amount of research has focused on applications of AR and VR in language education providing descriptions of the benefits of technology types (Fig.18).

XR types	Benefits	References
AR	Enhancement of problem solving, critical thinking and collaboration, enablement of authentic experiences, increase in motivation and satisfaction, improvement of learners' engagement by allowing content creation and user-friendliness.	Wasko (2013), Dunleavy, Dede & Mitchell (2009), Klopfer (2008), Bower et al. (2013), Radosavljevic, Radosavljevic & Grgurovic (2020).

VR	Long-term memory retention, users' active participation, incorporation of cultural and communicative aspects of language learning, enhancement of cultural awareness, complex and higher-order thinking, alignment of communicative learning with real-world challenges.	Billinghurst & Dünser (2012), Scrivner et al. (2018), Elia (2019), Berti (2020a; 2020b; 2020c).

Fig. 18. Benefits of AR and VR applications in language education.

From an analysis of educational applications of XR in and out of school contexts, it appears that its benefits have brought significant changes to the education field as institutions used XR to nurture people's engagement and involve them in group interactions to access content and purposefully learn together. Contextualising this analysis in educational and cultural sectors recovering from the pandemic outbreak of Covid-19 shows the importance of fostering interdependence amongst people deprived of opportunities to interact face-to-face, travel and utilise language skills in-person. Therefore, looking at the future of language education, investigating students' interdependence may shed some light on practices incorporating technology, out-of-school content and real-life interactions. In order to understand the potential effects of digital environments on participants' interdependence and in light of the evidence provided by the new scenarios which surged from emergency remote learning during the Covid-19 pandemic of 2020, it is useful to define the concept of online distance education as well as the benefits and challenges of using XR to foster mutually-dependent relationships.

3.4 Redefinitions of interactions in online distance education

In order to deepen the analysis of interdependence in remote learning contexts it is useful to understand the virtual educational environments where they may surface. Online Distance Education (ODE) has been utilised for the delivery of course content since the spread of Internet connectivity and computer-mediated operations (Anderson & Simpson, 2012). ODE types may be synchronous or asynchronous. While the former indicates live communication through virtual learning platforms such as *ZOOM, Google Meet* and *Microsoft Teams*, the latter defines a learning modality free from real-time interactions where educational materials can be accessed online at students' convenience (Abu Talib, Bettayeb & Omer, 2021). In both instances, students' groups are virtual teams whose existence is limited to digital environments allowing for the creation, transmission and

maintenance of effective interactions (Redondo, 2015; Morrison-Smith & Ruiz, 2020). A key requirement for the functioning of virtual teams is the building of trust and consolidation of authentic communication mediated by digital mediums through which participants act in synergies of purpose and skills. Concepts underpinning interdependent relationships are group sizes in relation to task scopes, balanced skills between members, individual accountability and synergies of purpose towards performance targets (Redondo, 2015). Therefore, patterns surfacing in real-life group interactions are transposed to virtual teams which create the conditions for interdependent relationships to arise.

While ODE has been used in conjunction with face-to-face teaching, the surge in the implementation of virtual teams in education following the outbreak of Covid-19 has transformed language learning in an entire remote activity. Teachers and students worldwide have grappled with technology in every aspect of their learning and resorted to virtual resources to compensate for missing social interactions. It became therefore necessary to reconsider worldwide education in terms of knowledge diffusion, accessibility and engagement with virtual resources previously considered as accessories to language learning or used as tools to boost informal and self-practiced learning modalities (Li & Lalani, 2020). Changes in social interactions brought by technology are likely to reconfigure the future of language education. For this reason, it is necessary to address the strengths and drawbacks of remote language learning with virtual tools in order to understand whether they can boost interdependence and supply for missing interactional elements provided by real-life contexts.

3.5 Advantages and limitations of virtual learning environments for social interactions and interdependence in remote language instruction

Given the reconfigurations of learning environments due to implementations of digital resources, multiple factors related to the use of XR in language education are assumed to affect levels of students' interdependence. The table below lists some of the most salient benefits and drawbacks of XR from which students' willingness to interact and establish interdependent relationships depends from. Parameters were identified from literature which mostly emerged in the aftermath of the pandemic outbreak of Covid-19 in 2020, during which the use of XR resources for educational purposes dramatically increased.

Benefits	Drawbacks	Literature
Quick and convenient online learning fostered collaborations.	The rapid switch from in-person to remote language course destabilised remote interactions and resulted in students' exhaustion, chronic absenteeism and confusion.	Abu Talib, Bettayeb & Omer (2021), Kaur & Bhatt (2020), Nadler (2020), Gacs, Goertler & Spasova (2020).
Increased availability of low-tech, cost-free, easily-accessible applications.	Expensive XR sets prevented programme accessibility.	Witherhold (2020), Gruber (2020), Liaw (2019).
Possibility to enhance social XR experiences with the use of video conferencing systems and low-cost devices such as *Google Cardboard*.	Potential restrictions of operating systems' compatibility with types of VR headsets.	Witherhold (2020), Gruber (2020), Liaw (2019).
Adaptability to multiple proficiency levels providing appropriate scaffolding by teachers.	Insufficient levels of preparation from teachers and instructors. Lack of emotional support from students' families.	Pongskadi, Kortelainen & Veermans (2021), Gruber (2020), Parmigiani et al., (2020).
Increased sense of students' agency in learning processes and low stress levels.	Privacy concerns and limited possibilities of face-to-face interactions.	Liaw (2019), Kaur & Bhatt (2020).

Fig. 19. Benefits and drawbacks of XR implementations in language education during emergency remote language education.

The aforementioned considerations underline that changes caused by the integration of ODE in language education blending face-to-face and technological practices entail considerations of their impacts on students' relationships with other group members and on their mental and emotional wellbeing. On this matter, Greener (2020, p. 807) stresses the vital role of teachers in "providing live connections to students as well as asynchronous sources, maintaining strong positive encouragement online, setting up ways for students to interact with each other online and enabling easy access to further support when needed". By facilitating students' interactions, teachers can help mediating

potential stress rising from prolonged connectivity. In fact, one of the major drawbacks of distance learning consists of students having experienced social interactions uniquely online. This has exposed them to considerable pressures impacting their wellbeing and learning abilities by the extensive use of video conferencing platforms in distance learning. This phenomenon is known as *ZOOM fatigue* (Nadler, 2020). Students' ease in the utilisation of these platforms has not always been helpful to relieve such stress. In fact, whilst it has been argued that young people are more technology-savvy than older generations (Vogels, 2019), their knowledge mostly arises from the use of technology as a tool to interact with others and compensate for temporary physical distances, not as the only means of communication. In fact, Greener (2020) argues that whilst the integration of technology into teaching has been a common practice for most teachers longer before the outbreak of Covid-19, students had to rapidly adjust to the encompassing presence of technology as the only source of social interactions. Therefore, it can be assumed that this phenomenon has strongly impacted students' social relationships with virtual spaces.

At the time of writing, education professionals worldwide are using ODE to teach content via video conferencing platforms used for sharing learning materials and assessing students' performance. With regards to universities, while some institutions have allowed students to attend classes in face-to-face (F2F) modalities, the vast majority is still attending academic lectures online. As of February 2021, the response of British universities to Covid-19 has resulted in a staggering 92,3% of institutions choosing online teaching methods versus 6,4% opting for blended learning in safety-assessed environments and limited in-person teaching (University Responses to Covid-19, 2021). This assumes particular importance for this analysis given that the participants to this study were attending universities in the United Kingdom.

By lacking certainties on the short-term possibility to return to face-to-face attendance during emergency language instruction, individuals heavily relied on technological devices to compensate for the missing in-person class attendance and to establish interdependent relationships impacted by virtual learning environments. In fact, from a cognitive and sensory point of view, online and in-person interactions are diametrically different. In fact, face-to-face interactions activate senses on multiple dimensions (sensory, visual, auditory) whilst individuals simultaneously search for cues in behaviours, facial expressions, gestures and spoken language which are not perceivable in online social exchanges. Conversely, when confronted with the flat dimensions of the screens in online interactions, users transfer their guesses on projections of human beings and this cognitive effort has detrimental effects on mutual reliance in goal attainment (Nadler, 2021). Therefore, the biggest challenge for interdependence in digital spaces is the shift from physical

to virtual engagements in social situations. Nonetheless, there are also several benefits provided by XR resources in language education with particular reference to interdependent relationships surfacing as individuals jointly engage in achieving online goals.

3.6 XR as booster of interdependence and intercultural awareness

Virtual resources enable learners to explore content on multisensorial levels and enhance their intercultural awareness. In fact, researchers have identified that real-like XR environments can help language students learn about cultural aspects at risk of being stereotyped by traditional educational materials (Elia, 2017; Berti, 2020a; 2020b; 2020c). In particular, Berti (2020c) mentioned that XR can offer practical environments for students to prepare for real-life interactions and the contemporary globalised society. The concrete, yet virtual, tasks that students do in virtual environments contribute to meaningful language learning through culturally-situated social interactions contrasting with the potential disengagement of less stimulating learning materials such as traditional textbooks. For this reason, virtual apps like *Google Arts & Culture* may be effective tools for heightening students' cultural awareness since they offer immersive activities on discovering museums' collections, landmarks, habits and historical backgrounds of countries where target languages are spoken. In fact, by being accessible on computers and mobile phones, *Google Arts & Culture* enables virtual immersions with the use of *Google Cardboard* and AR features. A good database of information for each cultural artefact is provided in virtual collections accessible in multiple languages. Due to its ease of accessibility and real-like environments consisting of 3D pictures and 360° videos, *Google Arts & Culture* can be used in language activities to foster students' interdependence. For instance, students may be involved in quest-based activities through museum collections to discover information on the artefacts and build their own virtual galleries relying on each other's inputs to reach a target. Examples of integrations of *Google Arts & Culture* in language learning are being continuously researched, although examples taken from school implementations show encouraging results. In fact, the use of the application was proved to strengthen students' social relationships and mutual dependability (Cottrell, 2020). These applications offer "panning motions, allowing students to explore 360° images and scenarios" (Scrivner et al., 2020, p.65). However, implementations of this application in language learning suffer from drawbacks constituted by the users' limited capacity of personalisation and modification of virtual materials. This may have consequences for the level of students' engagement in group activities since learners may be

prevented from accomplishing their goals due to limited modification capacities. To compensate for this, further applications need to be integrated to increase users' perceptions of agency in language learning processes.

An application permitting to make up for the lack of customisability of AR/VR interfaces is the integration of the tool *ThingLink* consisting of interactive learning modules (ILMs) which can be navigated by the audience. Once the background image is uploaded, creators can insert tags with links to text, audio, video, social media, photos and images, and write short descriptions of tag contents. The system identifies the type of media in the tag and displays it according to its functions, whilst the final products are sharable directly from the website (ETEC 510, 2015). The usefulness of *ThingLink* for language instruction is its capability to import content from external websites and add dynamism to virtual experiences with screen transitions fostering users' engagement with sound and video playing (Scrivner et al. 2020; Analla & Castek, 2020). Despite its benefits for language learning, investigations are missing on how these tools affect users' interactions in group work activities with particular reference to interdependence. In fact, gamified learning tasks have been explored to enhance users' engagement in language learning activities delivered through XR interfaces. However, indications of its positive effects can be found in studies on the enhancement of users' engagement in language learning activities with XR interfaces.

3.7 XR gamification for language learning, social connectivity and mutually-dependent interactions

Games are known for being inherently and intrinsically motivating given that they provide fun, intense emotional rewards (Connolly, Stansfield, & Hainey, 2011). In fact, they are able to make learning fun and motivating whilst boosting interactions with interactive and rich content embedded in game-like learning experiences (Bidarra & Coelho, 2017). This has given rise to *gamification*, defined as the use of "game-based mechanics, aesthetics and game thinking to engage people, motivate action and promote learning" (Kapp, 2012, p.10). By abiding to the three principles of mechanics (systems of goals, rules and rewards), dynamics (the way players enact the mechanics) and emotions (the feelings generated during the gamified experience), gamification develops digital storytelling and interactive technologies engaging students in intense and memorable learning (Lee & Hammer, 2011). In light of these affordances, implementations of games in language education have produced "highly customisable and socially connected language learning" (Holden & Skyes, 2011, p.4). With specific reference to social interactions,

successful implementations of XR in language-based games have shown positive results for students' motivation resulting in an enhancement of discussions and good team spirit (Costabile et al., 2008). Forms of collaborative participation through game-based learning have therefore been proved to support learners' engagement and motivation, helping to process and memorise content (Schmitz, Klemke, & Specht, 2012). Therefore, for an analysis on students' interdependence, it is useful to investigate implementations of these concepts through successful implementations of XR-based game-learning platforms.

A well-known online gaming resource for language learning is *Kahoot!,* which offers free quizzes integrating game mechanics in student response systems (GSRS). It provides interactivity in the form of competitive learning experiences interfacing with multiple devices which can be used to construct quizzes and assess students' knowledge whilst creating a playful and competitive game-based atmosphere (Alawadhi & Abu-Ayyash, 2021). The platform can be accessed on computer and mobile devices, with students entering the game with computer-generated PIN numbers and answer questions using their devices as consoles. The user-friendliness of *Kahoot!* is enhanced by questions being displayed in four graphical shapes divided by colour, which students select according to their answers (Alawadhi & Abu-Ayyash, 2021). Moreover, the platform enables multiple users' utilisation, implying that remote interactivity can be fostered through video conferencing screen-sharing.

Aside from the positive results of gamified XR applications in the enhancement of students' content retention, motivation, engagement, attendance, attention span and classroom discussion (Kay & LeSage, 2009), little research has been dedicated to an analysis of students' interdependence. In fact, what emerges as a downside of gamification for educational purposes is the potential weakening of virtual interactions and collaborations. Since in online games students may not have the chance to interact with other team members and each individual is concentrated on reaching a set goal within a given time, empathy and engagement might be lost (Bidarra & Coelho, 2017). Therefore, the efficiency of platforms such as *Kahoot!* in boosting students' interdependence depends on their integration in language activities adding opportunities for students to mutually depend on one another to accomplish task goals. In this way, the enhancement of individuals' engagement in gamified activities can be extended to the rest of the learning community.

Overall, despite the fact that gamified platforms have been proved to heighten participants' curiosity and engagement, investigations are missing on the impact of XR games on students' interactions and on their willingness to interact in groups. In fact, in the literature evidence is missing on whether XR can foster interdependence in language

students involved in task-based activities, especially in the context of learning Italian as a foreign language (FL). Nonetheless, some literature has been produced on XR implementations in Italian language activities, suggesting positive implications for future investigations on students' interdependence.

3.8 XR and language learning of Italian as FL

Applications of XR technology in teaching Italian as FL have centred on the use of VR in quest-based activities for intercultural learning. Interventions were conducted in immersive 360° experiences where students applied their language skills to decode representations of Italian urban landscapes in VR environments. The use of XR changed students' expectations, boosted their motivation to understand cultural aspects of Italy and enabled the personalisation of their learning experiences focusing on specific elements of the VR environments they were immersed in (Berti, 2019, 2020a, 2020b). Similar findings emerged from students' creations of Wiki environments based on digital museum collections, which allowed students to practice Italian whilst fostering teamwork and social interactions (Tyrou & Mirkos, 2018). Research on the use of Second Life, a Multi Users Virtual Environment (MUVE), have also been conducted in learning context of Italian as a FL, with high levels of engagement reported when avatars were used in real-like experiences. Benefits caused by virtual interactions were recorded as students perceived improvements in their language skills and nurtured their cultural understanding of Italy (Elia, 2017). Therefore, interventions based on Second Life environments demonstrated how contextualised role-play may foster students' mutual dependability in reaching task goals. In fact, learners applied theoretical concepts to accomplish group task by "making statements, advancing or balancing arguments, putting forward assertions to the group, disagreeing, modifying or replacing the perspectives of group members" (Jamaludin, Chee, & Ho, 2009, p.318). In other words, virtual environments provided the basis of discussion and argumentation as interdependence surfaced between group members. However, the XR tools applied in the aforementioned interventions have been limited to VR, hinting that further research can be done on the application of AR and MR in Italian language instruction. Moreover, further gaps in the literature should be addressed since an analysis on the impact of XR technology on students' interactions oriented to goal-attainment is missing.

3.9 Implications of XR for users' interdependence during museum-based language activities.

Museums have long been used as the preferred settings of informal education as they offered possibilities for students to learn outside of school contexts, offering tools for a multilingual approach to communication (Zipsane, 2020; Facing Challenge with Resilience: How Museums are Responding During COVID-19, 2020). Museums have also utilised technology as a virtual showroom sharing digitalised collections for promotional purposes (Zipsane, 2020). Therefore, the use of social media has been embraced by museums and cultural institutions to enable visitors to interact with one another and with the collections on display (Stuedhal & Smørdal, 2011). Social media has become a way to boost interactions and foster visitors to collaborate, understand and reflect on museum collections and share content. Consequently, digital tools surfaced as essential in facilitating interpretations of exhibition spaces and visitors' interactions, as well as in transforming museum visits in collaborative experiences importing skills from people's everyday lives to museum spaces (Heath & Vom Lehn, 2008; Ciolfi, Bannon & Fernström, 2008). In short, media and mobile phones appear to have the potential to transform the participatory character of museums by fostering interdependent group activities aimed at discovering information on the collections. These assumptions can be confirmed by interventions conducted at museums in Norway, Berlin and Prague (Stuedhal & Smørdal, 2011; Suzic, Karlíček, & Stříteský, V. 2016), which showed positive results for the enhancement of visitors' engagement and relationship building.

Overall, findings suggest that the interdependent relationships surfacing during museum visits may be similar to the mutual dependence of individuals involved in task-based language activities. However, major challenges are represented by a general reticence from museum institutions to make their services available for the community due to a lack of understanding of the affordances of digital experiences. In fact, despite general acknowledgements that collaborative opportunities are necessary to transform users into interacting agents on egalitarian basis (Jenkins et al., 2006), challenges have been reported when attempting to make audiences socially participate in digital museums spaces (Baggesen, 2014). For this reason, it can be assumed that procedures and expertise drawn from professionals outside of the museum sector may help in fostering users' engagement and interdependence whilst transforming museums into means of social cohesion and cultural transmission. This is why language education could constitute an asset for museums in terms of audience outreach.

From the point of view of language education, museums are "naturally multisensorial and multimodal" environments offering rich inputs and stimuli which foster holistic language use and vocabulary acquisition (Fazzi, 2019). The interest and curiosity stimulated in visitors may also offer opportunities to develop meaningful learning through storytelling and hands-on activities (Fazzi & Lasagabaster, 2020). Moreover, researchers have identified that interactions with museum objects have positive impacts on language students' affective factors, stimulate their willingness to communicate, their sense of empowerment and belonging (Weil, 2002; Ruanglertbutr, 2016). Given that task contents are drawn from authentic materials, digital collections have been incorporated in language activities both in and outside museums (Fazzi, 2019). With particular reference to XR, researchers have utilised digital museum materials to encourage learners to construct virtual collections using the target language as medium (Ho, Nelson, & Müller-Wittig, 2010). In fact, digital objects including 3D models and animations have been fused with real ones creating an interactive virtual space with content displayed in the target language. A very interesting aspect consisted in museum content being presented in interactive modalities without the need of physical users' presence in the collections, given that preliminary museum visits had exposed students to museum collections and the affordances of XR tools. However, task planning and implementation were conducted by groups of students outside of museum contexts as they worked on content, XR applications and language. Consequently, what emerged from this research is that the semiotic complexity of museums and the challenges presented by spaces not designed for language instruction can be overcome by the implementation of digital tools. In other words, XR resources may extend the short and occasional duration of museum visits, transforming them into interdependent learning with easily accessible language content.

These parameters have played an essential role in the aftermath of the Covid-19 pandemic, as museums and cultural institutions offered free resources accessible on their websites which boosted their social and digital presence and maintained steady levels of audience engagement with the collections. In fact, as Zipsane (2020) reported, "the demand for interactivity and participatory governance are as important as ever as museums and cultural institutions need to stay relevant for the people at large and not only for a limited elite". Examples of the integration of virtual museums can be found in the mobile application *Google Arts & Culture* which has seen an increase in the number of partnering institutions adding their collections to the database (Haigney, 2020). Features include the possibility to use the *Art Projector* function to visualise virtual projections of life-size paintings of museum collections. An additional example was provided by art students from the New Mexico Highlands University who utilised the application *Gather Town*

(https://gather.town/) to showcase their collections offering online visitors the opportunity to live-chat with the artists (Virtual Fall Exhibit December 10 for Media Arts and Technology, 2020). Furthermore, the Irish Museum of Modern Art adopted the XR platform *Vortic* (https://vorticxr.com/) to engage visitors in virtual explorations of live exhibitions by zooming on artworks and following live tours where they could ask live questions to museum educators. Further examples are provided by other institutions which adopted virtual resources consisting of interactive e-books, 360° collections views and VR gallery experiences (Fondazione Sandretto Re Rebaudengo, 2020; Musei Vaticani, 2020, The Victoria & Albert Museum, 2021). However, despite the interactive potentials of XR tools, guidelines have not been provided on how these resources can be integrated in remote learning settings. Additionally, indications are missing on potential ways in which XR resources can be implemented to foster students' interdependence in online language classes. All in all, it appears that despite the ample variety of virtual museum tools available for language education purposes, there is a lack of understanding in how these resources can be used for online educational purposes outside of museum contexts.

3.10 Towards interdependent-based XR language learning

This chapter has demonstrated that the field of educational research in XR technology offers numerous possibilities for supporting interdependence in language education. There is evidence that advancements in tool development may lead to the creation of sophisticated, user-friendly resources boosting engagement through virtual social activities. Being target-based, these resources could be transposed to virtual classes, integrated in TBLL-based lessons and used as interdependence-boosting tools by language learners.

Providing ease of accessibility and adaptability of the devices to online systems, as well as educators' know-how of the tools and of video communication platforms, XR can successfully stimulate students' interdependence by offering opportunities of dialogue, content sharing and goal-oriented discussions. This process can have significant implications for the language education sector which is increasingly adopting blended learning modalities. In fact, XR activities may prevent students' absenteeism and disengagement, stimulate curiosity and intercultural awareness with immersive activities targeted to group work.

Consequential interdependent relationships would be likely to arise from virtual interactions in which students use language to attain context-based goals. This process is particularly relevant for the field of learning Italian as FL since it could test the potential

effectiveness of virtual resources to boost students' interdependence. These are the reasons which inspired the creation of a number of interventions on students' interdependence which have been conducted in this research using virtual museum resources in online language classes of Italian as FL.

CHAPTER 4. METHODOLOGY

4.1 The research context

The worldwide academic response to the Covid-19 pandemic created the ideal conditions for the research question to be tested. In fact, the effects of virtual museums on interdependence were investigated online with Italian language students from the University of Manchester and the Modern Language Centre of King's College London (United Kingdom) in quality of participants.

The researcher contacted the Senior Language Tutor at the University of Manchester and the Deputy Team Leader at King's College London in October 2020. Both professionals were teaching Italian to undergraduate and postgraduate students and the researcher made their acquaintance in previous teaching experiences at both universities between 2012 and 2015.

During an initial correspondence with both tutors, the researcher enquired about potential interests in taking part to the research project and requested institutional clearance to conduct the interventions. The researcher also requested information on the online platforms used for remote teaching purposes and provided the tutors with an outline of the project. Both tutors confirmed that they were using the software *ZOOM* and agreed to take part to the project. Subsequently, the researcher obtained permissions to audit one class at King's College and five online classes at the University of Manchester between the 9th and 14th of November 2020.

4.2 The planning processes

Inspiration for the creation of these activities was taken from seminars on innovative digital practices of distant language learning supporting students' engagement. In particular, by attending webinars of Castek and Montgomery (2020), the researcher learned to use *ThingLink* and *Kahoot!* in online language learning contexts. The idea of integrating virtual museum collections of *Google Arts & Culture* in language activities came from the researcher's interest in digital art collections and innovative methods to learn languages in museum contexts.

The researcher kept the tutors updated on the activity planning so that they could suggest modifications. For instance, the activities would have originally included the use of the platform *Wakelet* to create a virtual gallery with links to paintings from *Google Arts & Culture*. However, both tutors underlined that there would not have been enough time for students to complete this type of activity. In fact, students would have risked to be confused and not understand the instructions they were given. Consequently, the researcher substituted the creation of a virtual gallery with a group selection of one painting on a given theme.

The time allocated to the activities differed according to the hosting institutions, which implied structural adaptations of the activities. As a result, students at King's College London were able to complete all four sections of the activity since they were engaged in longer conversations and took more time to complete the exercises. Conversely, as time limits were tighter at the University of Manchester, post-tasks were completed at the end of the focus groups.

The conditions for participants' selection varied by hosting institution and details have been provided in the following section. However, it is important to underline that age differences, language proficiency, educational background and number of languages spoken by the students have not been analysed in this research as potential factors affecting interdependence.

4.3 The participants

4.3.1 The University of Manchester

Participants' selection at the University of Manchester was conducted after an auditing period when the tutor gave the researcher freedom to select the participating groups. Once the choice was made, consent forms were submitted and the number of participants who gave their consent for data collection and analysis was 9, whereas the students who took part to the activity totalled up to 22.

Students were divided in groups by year of language study and educational background. In fact, those who had learned Italian prior to joining university constituted a separate group from their peers enrolled in the same academic year and language programme but without any previous formal education in Italian. All students were taking

Italian as a full-credit module combined with other subjects (languages, mathematics, physics, business, art and history). They were aged between 18 and 22 and their levels of language proficiency varied from B2 to C2.

The researcher collected data from three groups:

- First-year and second-year students with a background in studying Italian (included individuals with GCSE and/or A-Levels in Italian as well as native or near-native Italian language speakers).
- Fourth-year students who had spent a study or work period in Italy between 2019 and 2020 (shortened due to the Covid-19 outbreak).

4.3.2 The Modern Language Centre of King's College London

Participants were selected by the tutor, who initially agreed with the researcher that the experiment would have been conducted on a group of PhD students with a proficiency level of B2. A language class with this group was audited by the researcher in November 2020. During the second week of December 2020, forecasting potential challenges in data retrieval, the tutor redirected the researcher to a lecturer who had been teaching Italian to beginners. Therefore, the researcher simplified the grammar and vocabulary of the activity maintaining its structure intact. A week before the activity, the researcher introduced herself to the students and sent the consent forms to them. All participants returned their signed consents and attended the class.

Participants consisted of 6 individuals who were doing a PhD in Humanities. They were aged between 25 and 40 and studying Italian as a non-credit bearing module of their doctoral research, which was related to aspects of Italian language and culture such as art, religion or politics. They possessed an Italian language proficiency of A1 with knowledge of basic verb structures such present and past simple, adjectival formations and vocabulary. Prior to the activity, the tutor had taught students vocabulary related to Italian art.

4.4 Language requirements

In order to complete the activity, students were expected to possess beginner and intermediate Italian language skills.

4.4.1 Beginners (King's College London)

- To express likes/dislikes.
- To indicate positions.
- To describe objects.
- To know present and simple past tenses.

4.4.2 Intermediate/advanced students (The University of Manchester)

- To express and ask for opinions.
- To compare and contrast.
- To express agreement/disagreement.
- To motivate their stances on a given topic.

4.5 Research question

The research question underpinning this study was:

- What are the effects of virtual museums on students' positive interdependence in online classes of Italian as FL?

In light of the above, it was believed that the inclusion of virtual museums in language activities would maximise students' interdependent relationships to reach task goals. It was also hypothesised that interdependence would surface as:

- Pro-social behaviours of clarification seeking, negotiations and goal-orientation.
- Perceptions of peer collaboration as necessary to attain activity goals.
- Perceived ownership of the final activity product.
- Perceptions of individual contributions as valuable and effective to reach goals.

4.6 Research instruments

Data was collected using a mixed methods design (Dörnyei, 2007) combining qualitative and quantitative data retrieved from observations by the researchers and tutors, a questionnaire and a focus group with the students. The online activities enabling the data collection process were planned according to the TBLL framework proposed by Ellis (2003). Fig. 20 describes the process that was followed for data collection (Creswell, 2013).

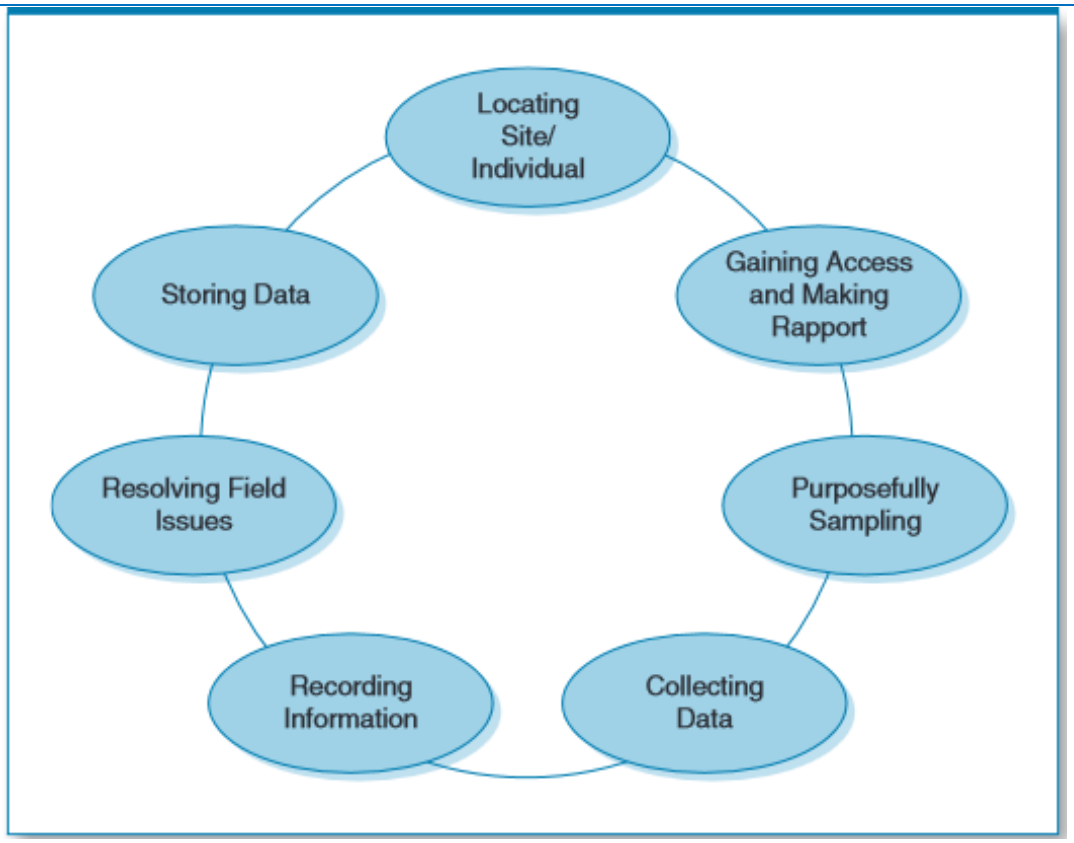

Fig. 20. Reprinted from *Qualitative Inquiry and Research Design* (p. 146) by J. Creswell, 2013, Thousand Oaks, US: Sage Publications.

4.7 Consent forms

Based on the indications provided by Creswell (2013) and Dörnyei (2007), the researcher created consent forms which were distributed to the students and tutors. They included details on the research project, study purpose, interventions' structure, potential risks involved, compensations, data storage and use as well as contact information of the researcher and supervisors. Copies of the forms have been provided in Appendix A at the end of this thesis.

4.8 Activity description

The activities were divided in three parts: pre-task, task cycle, post-task.

4.8.1 Pre-task

- **Brainstorming** activity on *ThingLink*.
    - **Modality.** Screen-sharing.

- **Type of work.** Individual.
- **Structure**. The researcher shared her screen. She opened tag to show the activity instructions; as tags were opened in numerical order, students raised their hands when they saw the picture corresponding to the painting in the background. Pictures displayed views of Italian towns similar to Venice in terms of features and by being located close to the sea or rivers.
- **Aim**. To introduce the topics of Venice and art and stimulate students' curiosity.

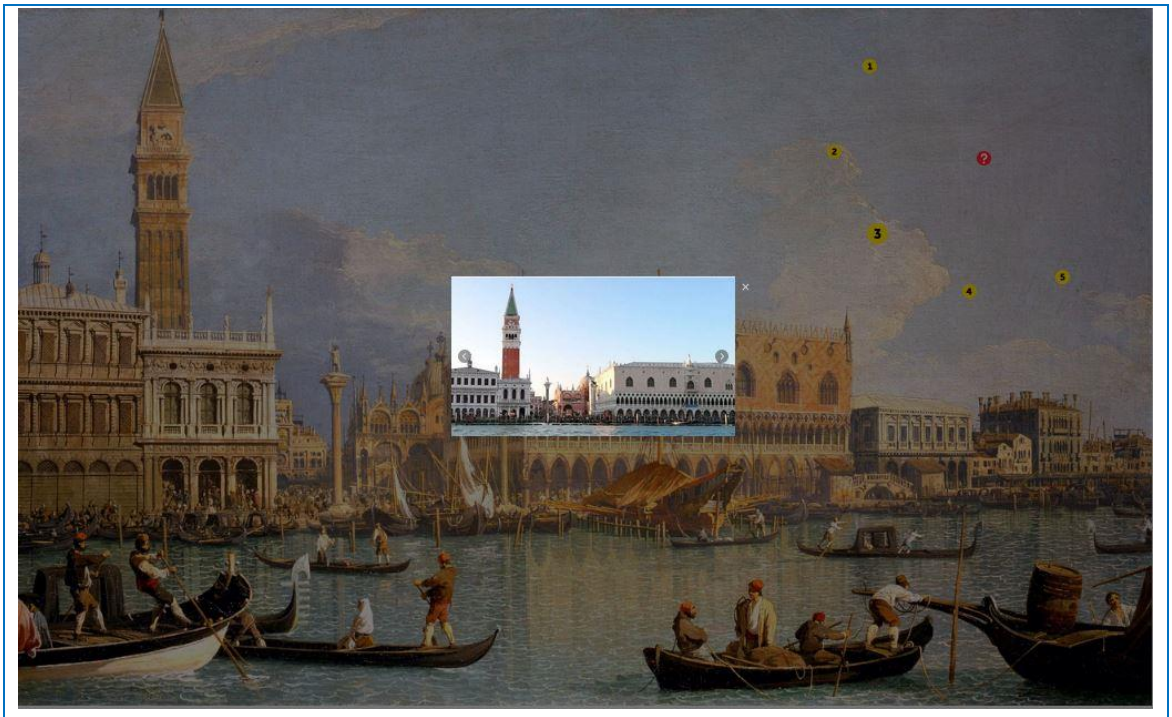

Fig. 21. Screenshot of the brainstorming activity on *ThingLink*.

Fig. 22. Screenshot of *ThingLink* used for the task cycle sections.

- ***Kahoot!* quiz.**
    - **Modality.** Screen-sharing.
    - **Type of work.** Individual.
    - **Structure.** Students opened the content of tag  in another window on their c**o**mputers and the link to *Play Kahoot!* on their phones. The tutor shared her screen on *ZOOM* showing the PIN number to the students. Students entered the PIN number displayed on their phones and used it as a console to answer the questions appearing in the shared *ZOOM* screen, whose dimensions were minimised to browse *Google Arts & Culture*. The time allowed to answer the questions varied between 60 and 120 seconds.
    - **Aims**. To help students familiarise with the platform *Google Arts & Culture* and stimulate classroom engagement. By playing the game, students activated sensory curiosity and learned how to navigate the virtual collections of Palazzo Ducale.

Fig. 23. Screenshot of a question in the Kahoot! quiz shared by the researcher with the students.

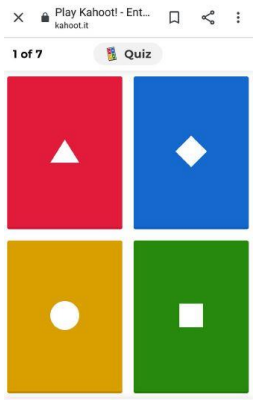

Fig. 24. Screenshot of potential answers as they appeared on phone devices. Students clicked on the colour corresponding to the options shown on the shared *ZOOM* screen.

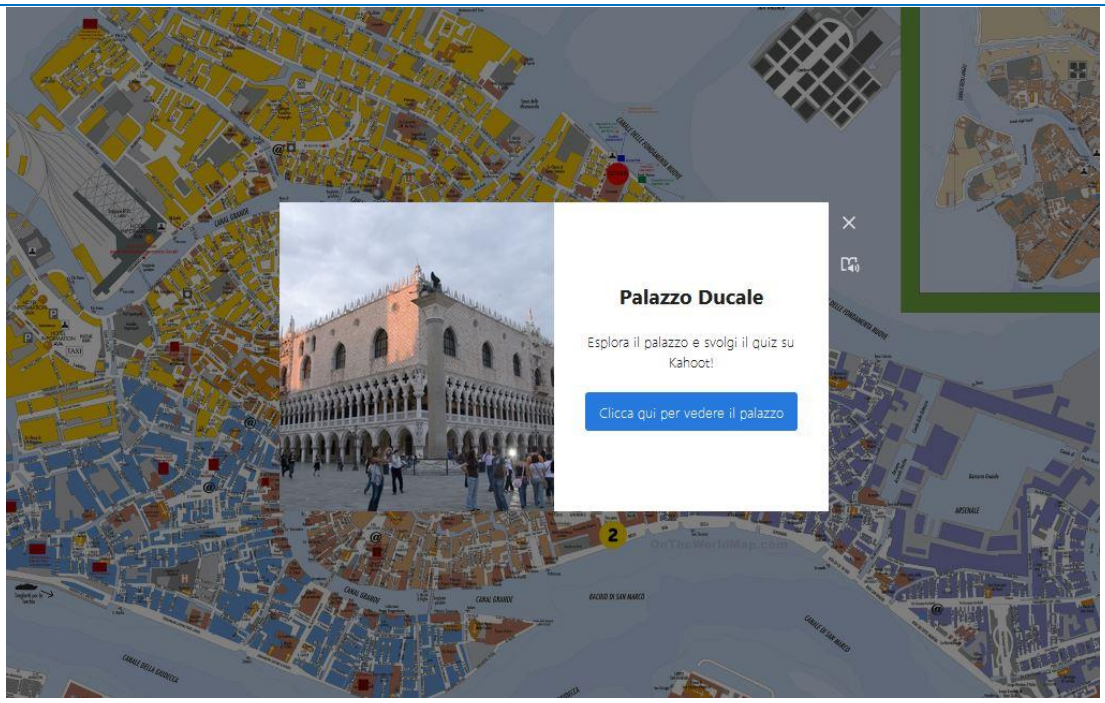

Fig. 25. *ThingLink* page used for the quiz on *Kahoot!*. Tag 1 contains the link to the page "Explore Palazzo Ducale" on *Google Arts & Culture* where students search for the answers to the quiz.

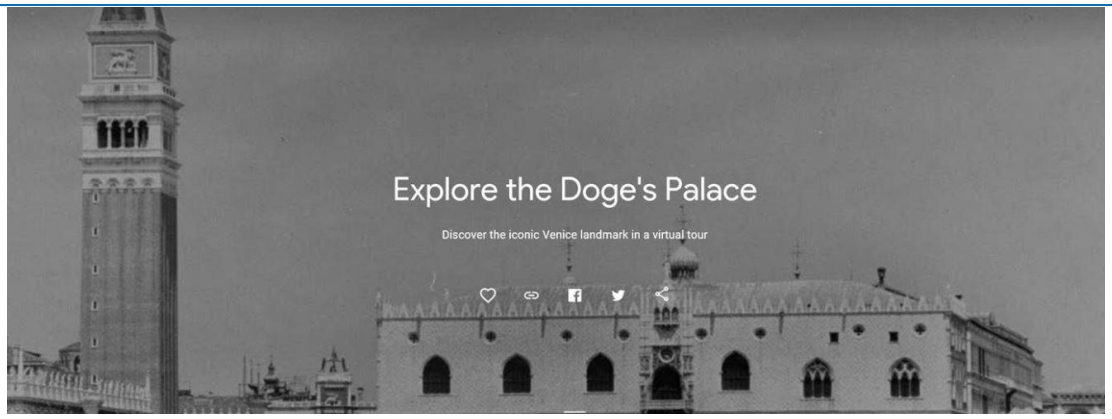

Fig. 26. Screenshot of the initial page of the VR activity on *Google Arts & Culture* where participants found the answers to the *Kahoot!* quiz. Contents were displayed in the language settings of the students' devices.

4.8.2 Task cycle

4.8.2.1 1st group/pair work activity.

- **Modality**. Document sharing.
- **Type of work**. Pairs/ groups of three.
- **Structure**. The researcher shared her screen to give students instructions. She showed students the Word document to work on and shared the document on

Google Drive via the *ZOOM* chat. Students needed to answer the questions in the Word document by comparing and contrasting two paintings using *Google Arts & Culture*. Once obtained receipt confirmation, the researcher assigned students to breakout rooms in pairs or groups of three. As students possessed different levels of proficiency in Italian, the set of questions differed in terms of grammatical, lexical and syntactic complexity but remained identical in terms of structure and content. Beginner students worked on the document provided in Fig. 27 while intermediate/advanced students used the table in Fig. 28. At the end of the activity, students shared the Word document in the *ZOOM* chat and motivated their answers in Italian once they returned to the main meeting room.

- **Aims**.
  - **Language:** to elicit vocabulary related to art, to practice language structures related to analysis and comparisons, to express likes and dislikes (for beginners).
  - **Interdependence:** to understand if students assigned roles to each-other, asked for suggestions and opinions, and negotiated language use**.**

Come viene rappresentato il "buon governante" in questi quadri? Confrontateli e rispondete alle domande. *How is the "good governor" represented in these portraits? Compare them and answer the questions.*		
	 Doge Pietro Grimani Data: 1752 Artista: Francesco Fontebasso Luogo: Palazzo Ducale di Venezia https://artsandculture.google.com/asset/portrait-of-doge-pietro-grimani/KgF7aEFqhl0HOw	 Barak Obama Data: 2018 Artista: Kehinde Wiley. Luogo: Smithsonian's National Portrait Gallery, Washington D.C. https://artsandculture.google.com/asset/president-barack-obama-kehinde-wiley/kgGqONkp0JVsCA
Quanti anni ha il personaggio in questo quadro? *(per esempio: 50? 85? 108?🤓)*		
Come sono i suoi vestiti? Trovate 3 aggettivi per descriverli. *(per esempio: eleganti, colorati…)*		
Quali differenze ci sono tra i personaggi? *(per esempio: educazione, status sociale…)*		
Quale personalità hanno i personaggi? Trovate 3 aggettivi per descriverli. *(per esempio: felice, triste…)*		

Fig. 27. Task activity for beginners.

Come viene rappresentato il "buon governante" in questi quadri? *Confrontateli e rispondete alle domande.*		
	 Doge Pietro Grimani Data: 1752 Artista: Francesco Fontebasso Luogo: Palazzo Ducale di Venezia https://artsandculture.google.com/asset/portrait-of-doge-pietro-grimani/KgF7aEFqhl0HOw	 Barak Obama Data: 2018. Artista: Kehinde Wiley. Luogo: Smithsonian's National Portrait Gallery, Washington D.C. https://artsandculture.google.com/asset/president-barack-obama-kehinde-wiley/kgGqONkp0JVsCA
Quanti anni aveva il personaggio in questo quadro?		
Che cosa vuole comunicare il personaggio con i suoi vestiti? *(per esempio: ricchezza, benessere, conservatorismo…)*		
Quali differenze sociali ci sono tra i personaggi? *(per esempio: appartenenza alla classe aristocratica, livello di istruzione…)*		
Quale personalità esprimono i personaggi in questi quadri? *(per esempio: autoritaria, seria, conservatrice…)*		

Fig. 28. Task activity for intermediate students.

4.8.2.2 2nd group/pair work activity

- **Modality.** Platforms *ThingLink* and *Google Arts & Culture*.
- **Type of work**. Pairs/ groups of three.
- **Structure**. The researcher shared her screen with the *ThingLink* page to give instructions to students. She divided students in breakout rooms and in the same pairs/groups of the previous activity. Students opened tag 2 on *ThingLink* with the link to the virtual gallery of Palazzo Ducale on *Google Arts & Culture* (Fig. 29). They chose one painting that best represented their idea of "good governor", shared the link in the *ZOOM* chat and motivated their choices once they returned to the main meeting room. While Fig. 30 presents the page used by beginner students with simplified instructions and English translations, Fig. 31 displays a screenshot of the *ThingLink* pages used by intermediate and advanced students. In both pages, tag 2 contained the link to the *Google Arts & Culture* profile of Palazzo Ducale where students accessed virtual collections and conducted their painting search.
- **Aims**.
  - **Language:** to use art vocabulary to describe paintings, ask questions and express opinions in Italian.

- **Interactions:** to collect data on students' interdependence (turn-taking, role assignment, clarifications inquiries, lead-taking, goal-oriented behaviours).

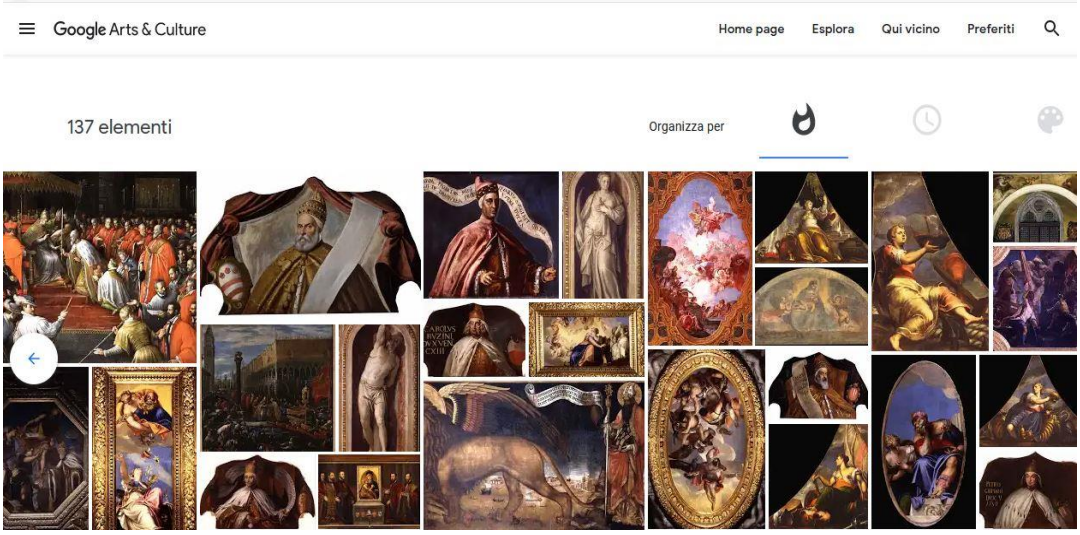

Fig.29. Screenshot of the virtual collection of Palazzo Ducale as displayed on *Google Arts & Culture* (Italian).

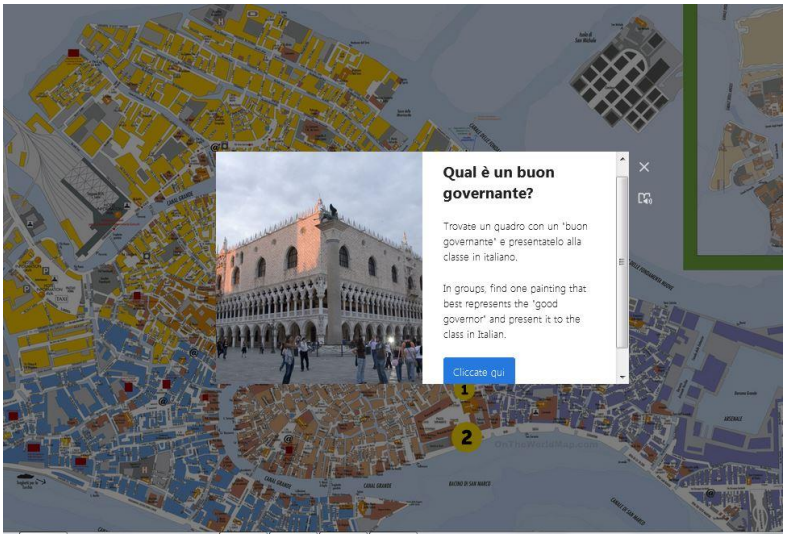

Fig. 30. ThingLink page used by beginners.

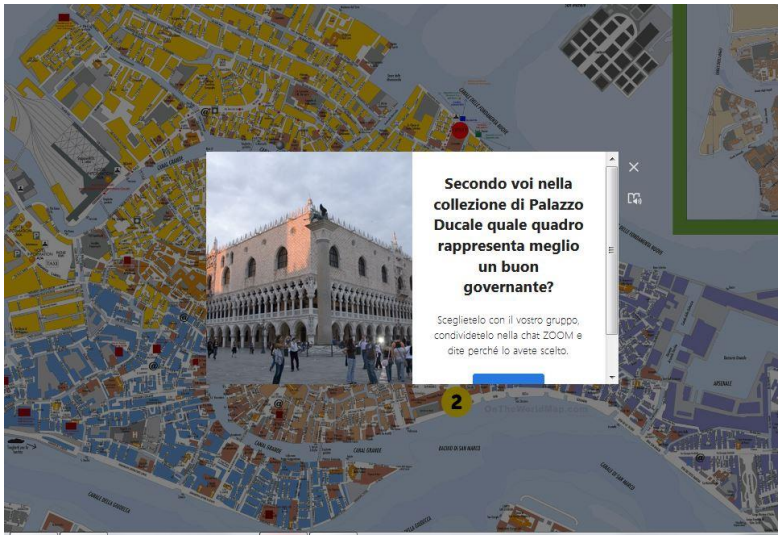

Fig. 31. ThingLink page used by intermediate/advanced students.

4.8.3 Post-task

- **Modality.** Screen-sharing.
- **Type of work**. Individual.
- **Structure**. The researcher shared her screen, used the annotate tool in the control tab and instructed students on how to use the stamp function. Students put a virtual stamp on the shared on a scale from *benissimo* (very well) to *malissimo* (very bad). The researcher saved the answers as screenshots.
- **Aims**. To make students evaluate their experience of group work with technology.

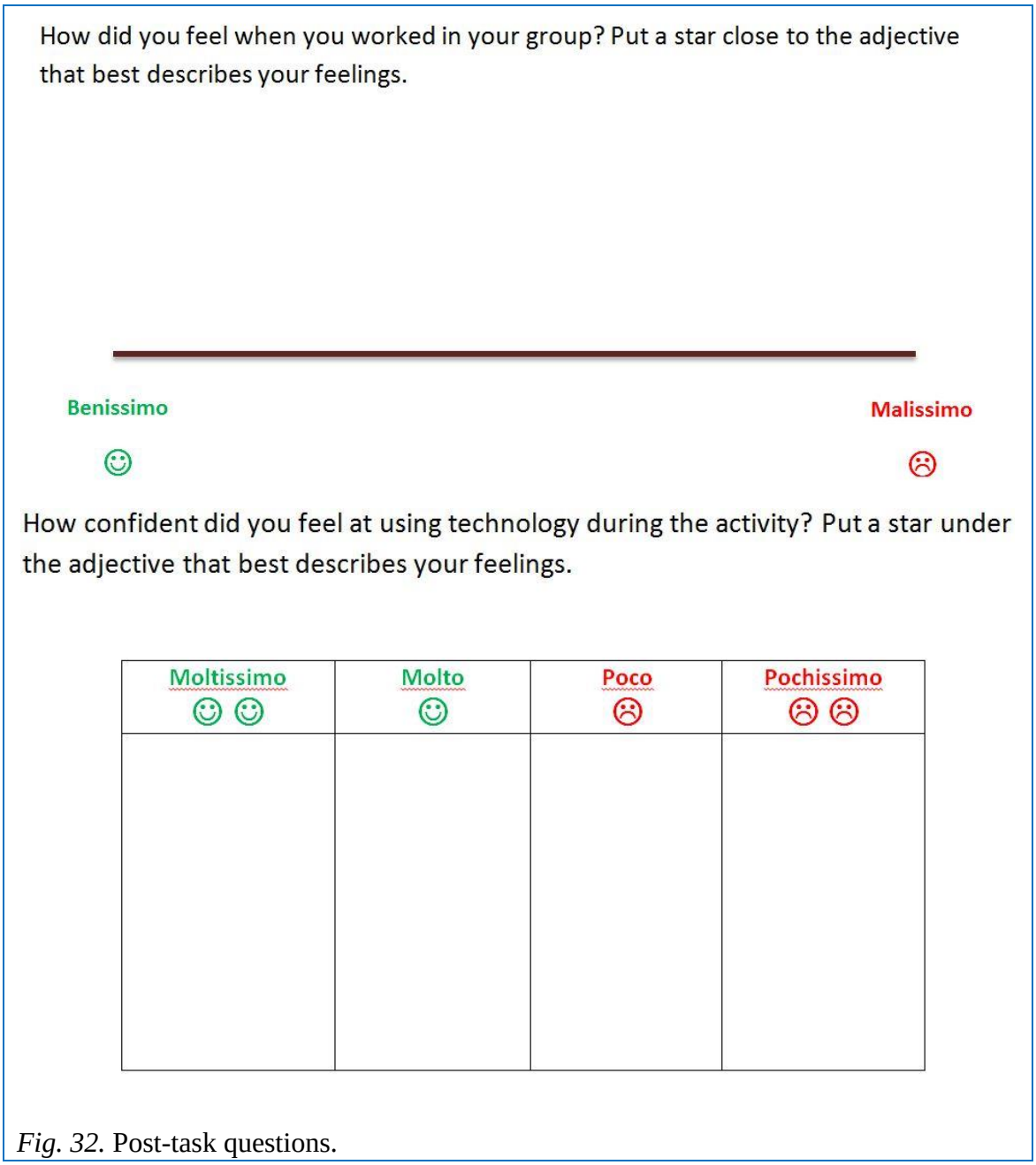

Fig. 32. Post-task questions.

4.9 Virtual tools

The researcher recorded the activities, focus groups and tutors' interviews using *ZOOM* and a *Victure V3* digital voice recorder. Consent was received from the participating institutions and the *ZOOM* meeting was recorded together with breakout rooms.

4.10 Questionnaires

At the end of the activity, the researcher distributed a questionnaire to the participants created with *Google Forms*. The questionnaire consisted of 25 items structured on a 4-points Likert-scale, yes/no and open-ended questions. Questions were in English, marked with * when obligatory and grouped by topic area.

- User-friendliness of applications
    1. How easy was *Google Arts & Culture* to navigate? *
    2. Before this activity, had you ever used virtual museums to create class content?
- Likes/dislikes
    3. Which part of the activity was your favourite? *
    4. Could you describe why you liked it?
    5. Which part of the activity did you like the least? *
    6. Could you describe why you didn't like it?
- Interdependence and group work
    7. Was this the first time that you worked together with other students on website content during language classes?
    8. Did you feel that virtual environments stimulated interactions with your peers? *
    9. Were virtual museums helpful in making you interact with your partners? *
    10. Could you describe why you think so? *
    11. During which activity did you feel that your partner offered the most interesting ideas? *
    12. Do you feel that the use of Italian facilitated interactions? *
    13. In which of these two activities do you think you deployed your team-work skills the most? *
    14. How do you rate your group engagement in the activity? *

- Perceived ownership and satisfaction/dissatisfaction of the final group choice
    15. Do you feel that your contribution to the group conversations made it easier to achieve the goal of the activity? *
    16. In which way? *
    17. Would you describe the choice of painting as more “yours” or more the result of your partner’s contribution? *
    18. How? *
    19. Did you feel satisfied about the painting that your group chose? *
    20. Could you explain why you felt satisfied/dissatisfied?
    21. Do you feel that you allowed your partner enough time to speak during conversations? *
- Virtual activity enjoyment
    22. Did you enjoy this virtual activity? *
    23. If you answered "YES", could you describe why? (write "n/a" if you answered "NO”) *
    24. If you answered "NO", could you describe why? (write "n/a" if you answered YES) *
    25. Do you have any suggestions to improve this virtual activity?

4.11 Focus groups

Focus groups were conducted a day after the activities were performed, with the exception of one group from the university of Manchester which joined the interview soon after the tasks ended. Since participation was voluntary, not all of the students who took part to the activities joined the focus groups. For instance, only one student from King’s College London participated. Nevertheless, the data obtained during this one-to-one interview were merged with information collected from the 9 participants of the University of Manchester.

In-person focus groups modalities were applied to virtual *ZOOM* environments and lasted for approximately 45 minutes (Baldry, 2005; Turney & Pocknee, 2005; Dörnyei, 2007; “Virtual Focus Group Discussion: participatory methods at times of Coronavirus”, 2020). The interviews were aimed to understand whether:

- Control over the learning situation was shared or individually managed.
- Interdependence could lead to persistence in interactions and development of trust bonds.
- Virtual museums could foster positive interdependence.

- Students helped and assigned roles to each other.
- Individuals felt in charge of the task or relied on mutual help for task completion.
- Pro-social rules of altruism, cooperation and equality were established.
- The virtual activity resulted in competition, individualism and potential conflicts in decision-making processes.
- Individuals could evaluate learning situations in terms of fairness and trustworthiness.

The questions were based on the following topics: opinions on the use of virtual museums, online versus in-person group work, perceptions of ownership of final decisions. Despite the fact that modifications occurred in the course of the live interviews, the questions generally corresponded to the following list:

- **Introductory question**
    - Tell me about your experience with emergency online learning between 2020 and 2021. What are the main challenges that you have experienced? Which aspects of in-person classes are you missing the most? What are the strategies that keep you motivated to pursue your studies?

- **Task-related questions**
    - After having done this online activity, what are your opinions regarding the use of virtual museums as instruments of language learning?
    - What are you missing the most about in-person classes? Which aspects of online group work are similar to them? Which aspects do you think are different?
    - Which similarities did you initially find between the portrait you had chosen and the one selected by your partners?
    - Which procedures did you follow to reach an agreement on the painting choice?
    - Could you describe a moment when you felt you had to accept your partners' painting preferences despite not fully agreeing with them?
    - And a moment when you felt you were leading group discussions?
    - Could you describe a moment when you felt that your contributions to the painting choice were useless?
    - How did you choose the person who presented the painting to the rest of the class?
    - Overall, did you feel challenged by the activity? Why?

- **Concluding questions**
  - In your opinion, what is a good way to enhance partners' interactions during online activities?
  - Is there anything else you would like to add?

4.12 Observation grid

To support information retrieval, the researcher decided to involve tutors in the data collection process. In fact, tutors completed an observation grid in a Word document (Fig. 33) by writing students' names and indicating situations of interdependence arising from students' interactions. Once completed, the grids were sent to the researcher, who also interviewed tutors to inquire more information about teachers' observations.

Scrivi i nomi degli studenti e metti una crocetta in corrispondenza del comportamento che dimostrano

		Lascia parlare il compagno.	Chiede al compagno se ha capito come svolgere l'attività.	Prende parola per primo/a nelle conversazioni.	Rispetta i turni di parola.	Chiede al compagno se conosce il significato delle parole in italiano.	Chiede opinioni al compagno.	Si mostra coinvolto nelle conversazioni.	Mostra interesse a lavorare in gruppo.
Nomi									

Fig. 33. Grid used by language tutors to monitor students' interdependence. Translations are as follows:

- Title: write the names of the students and tick the behaviours they display.
- Upper columns (from left to right): the student lets partners talk, the student asks partners if they understand how to do the activity, the student speaks first during conversations, the student abides to turn-taking, the student asks partners if they understand the meaning of words in Italian, the student asks for partners' opinions, the student is involved in conversations, the student shows interest in group work.

4.13 Unstructured interviews

The researcher conducted one unstructured interview per tutor on the platform *ZOOM*, each of which lasted for 30 minutes and elicited opinions on the levels of inter-dependence observed amongst the students. This methodology enabled the collection of relevant information by allowing interviewees to feel comfortable in a natural conversational setting (Dörnyei, 2007). Moreover, it permitted tutors to provide their impressions on students' group behaviours and individual attitudes while the researcher listened and recorded the interview. Occasional interruptions occurred as the researcher asked for clarifications, but they were generally very limited. In this way, tutors provided as many details as possible of the students' interactions they observed.

The questions posed by the researcher were guided by aspects highlighted in the observation grid, such as degrees of students' interactivity and enjoyment of virtual tools, respect of turn-taking and of their peers' talking space as well as Italian usage. The interview was not piloted prior to delivery.

The questions asked were as follows:

- In your opinion, what are the most relevant aspects that you identified in group interactions during this virtual activity?
- Did you notice changes in terms of levels of interactivity and language production during these activities from the usual classes you have with the students?
- Are there any further observations that you would like to add?

4.14 The online experiments

4.14.1 Preliminary procedures

Before starting the experiments, the activity structure and data retrieval methods were piloted and revised to check language complexity, reword ambiguous statements and detect spelling errors.

Signed consent forms from tutors and students were received by 18th February 2021. All students agreed to participate in the experiment on a voluntary basis. The researcher taught the whole activity which lasted for approximately 1 hour.

A week before the activities, the researcher sent instructions to the students on how to play *Kahoot!* and navigate on *Google Arts & Culture*. Once time availabilities were

collected using the scheduling tool *Doodle*, the researcher sent participants a *ZOOM* invitation to participate in the focus group interview.

With regards to *ZOOM*, it was decided to use the researcher's personal account for the focus groups interviews and the institutional one to deliver the activities. In the latter case, the researcher was made host by the tutors (demoted to co-hosts) to facilitate the management of breakout rooms.

4.14.2 King's College London

The intervention took place on 18th February 2021 between 11:20 and 12:40 (GMT). Students kept their videos activated but silenced their microphones in the main meeting room. They turned them on during group activities. There were 2 breakout rooms of 3 students each for both task planning and task cycle. The post-task questions were completed at the end of the activities.

The researcher started the activity at 11:20 and finished it at 12:40. Timing was divided as follows:

- **Pre-task**
  - Brainstorming: 3 minutes.
  - *Kahoot!* quiz: 15 minutes.
- **Task cycle**
  - ID completion of the "good governor" on a Word document and class discussion: 30 minutes.
  - Painting search on *Google Arts & Cultures* and class discussion: 30 minutes. 2 breakout rooms. 2 breakout rooms, 3 students in each room.
- **Post-task**
  - Peer review: 5 minutes.

As soon as the activity ended, the researcher sent an invite to the students asking them to complete the online questionnaire and participate in a focus group. However, even though the researcher had asked students to send the documents with the ID of the "good governor" via email or *ZOOM* chat, no files were returned at the end of the activities.

No technical glitches were experienced during the activity. Wi-Fi connection was stable for both students and researcher. Nevertheless, critical issues emerged during the

activity. In fact, the researcher had originally planned to elicit information only from participants' interviews and collect answers through the questionnaire, leaving students' interactions unrecorded during group activities in order to lower potential stress-levels. However, at the beginning of the activity the researcher learned that the great majority of students could not participate in the focus group interview due to other commitments. Therefore, in order to retrieve data on students' interdependence, the researcher decided to assign the tutor to one of the two breakout rooms and monitor students' interdependence in the other. Despite initial concerns related to potential disruptions students' interactions caused by the researcher's and tutor's presence, students talked to each other without involving the observers.

4.14.3 The University of Manchester

The interventions were conducted on 22nd and 24th February 2021 between 11:00 – 12:00 and 15:00 -16:00 (GMT) on the video communication platform *ZOOM*. Since the activity on 24th February was followed by the focus group interview, the researcher obtained permission to use her personal *ZOOM* account for both sessions. For both task planning and core sections, students were split across a maximum of 4 breakout rooms with 2/3 individuals each and kept their videos on but silenced their microphones in the main meeting room. They turned them on during group activities.

Due to allocated time slots of 1 hour, all group activities lasted for no longer than 55 – 60 minutes. Consequently, due to timing restrictions and unforeseen delays in speaking activities, the researcher skipped the post task which was performed only during the focus groups. Following the request of sending the documents of the ID of the "good governor" via email or *ZOOM* chat, only two files were sent at the end of the activities (see Appendix C).

Timing was as follows:

- **Pre-task**
  - Brainstorming: 3 minutes.
  - Kahoot! quiz: 15 minutes.
- **Task planning**
  - ID completion of the "good governor" on a Word document and class discussion: 20 minutes.
- **Task core**
  - Painting search on *Google Arts & Culture* and class discussion: 20 minutes.

- **Post-task**
    - Peer review (during the focus group): 5 minutes.

During the task planning and task core phases, the researcher and the tutors switched rooms every 5 minutes to successfully monitor participants' interactions.

The first issue emerged at the point of students' group divisions since some students sent their consent forms while doing the activity. Consequently, the researcher reorganised breakout rooms in the middle of the activity according to the consent forms received. Prolonged technical issues were not experienced, although the connection of one participant was lost whilst her group was choosing the painting from the virtual gallery of Palazzo Ducale on *Google Arts & Culture*. When she reconnected a few minutes later, the other group members had concluded their negotiations and the participant missed her opportunity to participate in the painting selection. Another issue occurred when the researcher could not demote the tutor to co-host of the *ZOOM* meeting and this prevented him from choosing when to enter or leave rooms. Despite this drawback, the quality of data retrieval was unaffected.

4.15 A methodology for data analysis

The following chapter will provide an in-depth analysis of the data collected through the activities outlined above. Specifically, data will be analysed according to patterns of interdependence that surfaced during the activities and illustrated with transcripts of students' conversations, questionnaire comments, focus groups and tutors' interviews. Data will be presented in graphs and diagrams showing students' questionnaire responses. Participants will be anonymised with their first names' initials while captions will describe extracts with students' and tutors' comments, which have been numbered differently from graphs and tables. Verbatim transcriptions of students' conversations in Italian will be provided together with their English translations as per the indications provided by Clark et al. (2017). Content will be repeated in English whenever both languages are displayed in the same sentence. Underlined statements will highlight students' interdependence surfacing in verbal and non-verbal language, which will be indicated between round brackets. Any missing content will be annotated in square brackets in the English transcriptions. Despite the fact that the interviews had originally been conducted in Italian, transcripts of tutors' interviews will be provided in English. With regards to students' responses to the open-ended questions in the survey, verbatim transcriptions will be provided.

The results presented in the current research were analysed on the data collected from the two participating institutions during two group activities of the task cycle. Overall, the results obtained from the researcher's and tutors' observations, the online questionnaire and focus groups strongly support the hypothesis that the use of virtual museums fosters students' positive interdependence in online language classes of Italian (Fig. 34). Active collaboration enabled individuals to attain goals through solution-seeking, choice negotiation and modulated decision-making. Once these conditions were attended, participants perceived a shared sense of ownership of the final group selection and individual contributions were identified as valuable and effective to reach goals. Behaviours were pro-social in nature in respect to turn-taking and role assignment. These aspects were observed to be more prominent in participants with high levels of language proficiency, while they appeared to weaken at lower levels of linguistic competence. The influence of motivation was also deemed to considerably affect students' interdependence.

The analysis of qualitative and quantitative data consisted in 5 steps:

- Content transcriptions of focus groups, tutors' interviews and group activities.
- Categorisation of the themes according to retrieved data.
- Search for themes and recurrent behavioural patterns.
- Elaboration of the results.

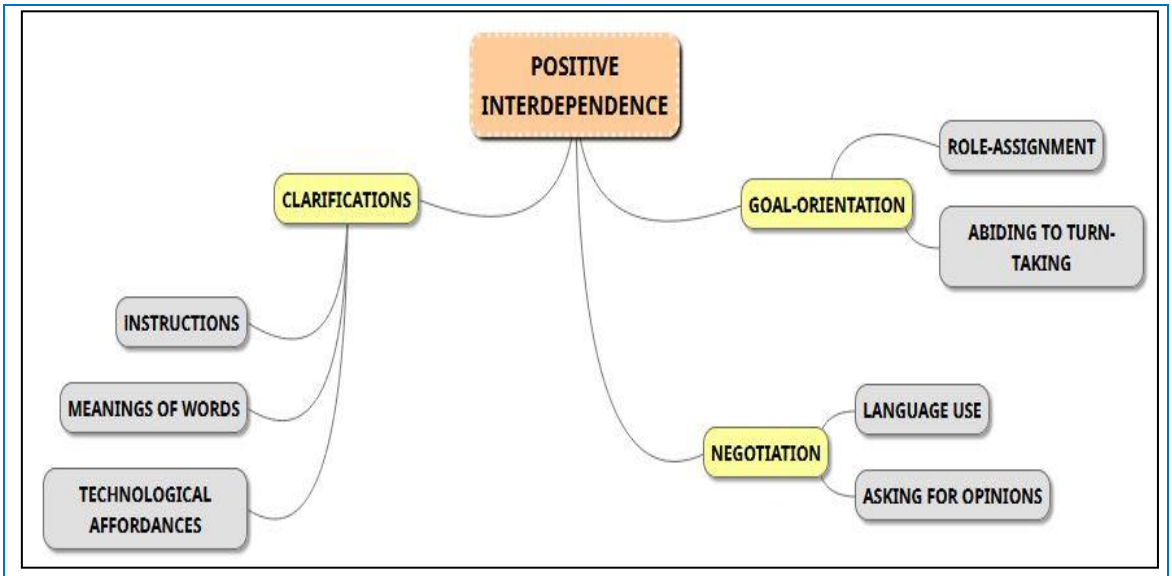

Fig. 34. Summary of the results on students' interdependence obtained from data analysis.

In this chapter, evidence from the data will be used to demonstrate that cooperation was an underlying element of interdependence surfacing as instruction clarification and technological affordances. Results will be analysed in light of transcriptions of students' interactions and qualitative information from the questionnaire, focus groups and interviews.

5.1 Clarification seeking

Observations revealed that group dynamics were initially characterised by clarifications on activity goals and instructions. Students searched for their partners' confirmation to verify whether their information matched and demonstrated reliance on mutual help.

Extract 1: participants' conversations during the 1st group/pair work activity of the task cycle.

L: Ma dobbiamo provare ad indovinare oppure ce lo dice da qualche parte?	L: *(referring to the way answers should had been given in the exercise)* Do we have to make a guess or is it stated somewhere?
I: Ma dobbiamo fare tutti una risposta diversa? Com'è?	I: So, does each of us need to provide a different answer? How do we proceed?
H: Eh no, penso che possiamo dare la stessa risposta io e te.	H: No, I think you and I can give the same answer.

In addition to verbal cues, students resorted to non-verbal language to clarify meaning. They used hand and body gestures to support their explanations and provide indications to their partners. Non-verbal language was short in duration due to realisations of the impossibility to fully convey the intended message given the visibility constraints of webcams. Nevertheless, this demonstrated that students used the communication strategies they would normally adopt in face-to-face interactions to clarify and emphasise meaning, substituting the in-person communicative environment with a virtual one.

Extract 2: participants' conversations during the 2nd group/pair work activity of the task cycle.

L: Sì, come un uomo della gente.	L: Yeah, like a man of the people.

Z: Sì, più aperto, anche se ha le braccia incrociate. *(crosses her arms in front of her chest)*	Z: Yes, [he is] more open [to dialogue], even with crossed arms. *(crosses her arms in front of her chest)*
I: Secondo me non sembra molto ricco. Non sembra avere molto potere perché non vediamo tanti *joyas*. *(shows his chest as if he had been wearing big jewellery and ornaments)*	I: I do not think he looks very rich. He does not seem to have much power because we don't see much *joyas*. *(shows his chest as if he had been wearing big jewellery and ornaments)*
I: Guarda questo, di Giovanni Bembo, il finale. *(makes a gesture to signal his partner to swipe right towards the end of the virtual gallery)* Non sembra molto buono, ma sembra savio, intelligente. Non so il perché.	I: Look at this one, the one of Giovanni Bembo, the last one. *(makes a gesture to signal his partner to swipe right towards the end of the virtual gallery)* He doesn't look very kind but he looks wise, intelligent. I don't know why.

In other instances, clarifications were not sought for. In fact, students appeared to be concentrated on understanding how the virtual museum platforms worked, rather than seeking for partners' help. This caused rather apathetic responses from partners, whose unwillingness to engage in the conversation might have been caused by a feeling of being prevented from giving their contribution to achieving task goals.

Extract 3: participants' conversations during the 1st group/pair work activity of the task cycle.

A: Oh my God, there are so many links! Quanti anni aveva in questo quadro? Wait, what? There are the answers? No ok, I understand. We need to click on the link. Are we just guessing the answers? Because on the link there is no information about the painting. *(the researcher gives further instructions)* B: Ah, right.	A: Oh my God, there are so many links! How old was he in this painting? Wait, what? There are the answers? No ok, I understand. We need to click on the link. Are we just guessing the answers? Because on the link there is no information about the painting. *(the researcher gives further instructions)* B: Ah, right.

A: Barak Obama è l'immagine dell'uomo governo. Pietro Grimani è un italiano, Barak Obama è un uomo americano. Che dici *(says the other participants' name)*? B: *(No answer).*	A: Barak Obama represents the man of the government. Pietro Grimani is Italian, Barak Obama is American. What would you say *(says the other participants' name)*? B: *(No answer).*

It is safe to assume that despite the fact that language choice was highly dependent on language proficiency, it was also cooperatively used to ascertain group understanding on the activity instructions. This can be observed in phenomena of code-switching between English and Italian deployed to clarify meanings in the target language and enable individuals' involvement with lower proficiency levels. Students uttered sentences in Italian and repeated them in English, perhaps as a result of being unsure about their partners' ability to understand the language. They appeared to stop translating sentences into English as they realised their language levels matched. If they detected a mismatch, they kept providing English translations of Italian sentences or used English as the main language of their interactions. As it can be seen from the example below, student H stopped translating sentences once student I signalled his understanding of the questions' meaning. As he produced more sentences in Italian, no further translations were provided.

Extract 4: participants' conversations during the 1st group/pair work activity of the task cycle.

H: […] It's like he is a member of the aristocracy and the church. *(reads one of the questions Italian)* It means like… *(translates the question into English)*

I: Sì ho capito (Yes, I've got it).

Similar observations were reported by one of the tutors.

Extract 5: tutor's observations of students involved in the 1st and 2nd group activity of the task cycle.

One student repeatedly used English. The others replied in English but used Italian when describing the paintings. Overall, there was a good balance in the use of the two languages.

Another interesting aspect of interdependence surfaced from the relationship between clarifications and technological affordances. In fact, some students shared their screens to clarify their intentions and talk about specific paintings, while others uploaded

documents on *Google Drive* to jointly work on the task as they explored the virtual galleries.

Extract 6: participants' conversations during the 1st group/pair work activity of the task cycle.

I: Possiamo fare un file noi insieme. Faccio una copia e ti invito al mio document. Un secondo e mi dici la tua email. AAAH "Google Docs encountered an error". Perfetto.	I: We could create a file together. I create a copy and I invite you to my document. One second and you can let me know your email address. AAAH "Google Docs encountered an error". Perfect
H: I am not surprised.	H: I am not surprised.
I: Vuoi fare tu una copia?	I: Do you want to make a copy of it?
H: Sì, un attimo. I got the error as well. Forse è meglio se scarichi il documento and then try to edit it in your computer.	H: Yes, one second. I got the error as well. Maybe it is better if you download the document *(switches to English)* and then try to edit it in your computer.
I: *(types on his computer)* Ora posso compartir. Qual è la tua email? Puoi ripetere?	I: *(types on his computer)* Now I can share it. What's your email address? Could you repeat it?
H: *(spells it out).*	H: *(spells it out).*
I: Dimmi se lo hai ricevuto.	I: Tell me if you have received it.

Thus, once instructions were clear, students used virtual museums to create collaborative and mutually dependent bonds. For instance, virtual galleries were used to communicate meanings whenever oral channels were not enough to deliver their intentions.

Extract 7: participants' conversations during the 2nd group/pair work activity of the task cycle.

H: *(referring to a painting)* 'petta eh, come si chiama?	H: *(referring to a painting)* Wait, what's its name?
I: Giovanni. Bembo. Da Domenico Tintoretto.	I: Giovanni. Bembo. By Domenico Tintoretto.
H: Riesci a fare tipo share screen? Perché non riesco a trovarlo.	H: Can you share your screen? I can't find it.

I: Sì, è di l'ultimo. Quello…ah no no 'petta, quello. *(indicates a painting with the pointer)* Ma anche quello, uh, non so. A: Which one is it? B: You can cross the bottom paintings (counts), number seven. A: Is it the one with the two pillars over the top? B: Yeah, that's the one.	I: Yes, it's the last one. That one…ah no no wait, that one. But also, that one *(indicates a painting with the pointer)*, uh, I don't know.

Some participants used technological affordances to make ironic assumptions about the characters in the paintings. This indicated that students had reached a good level of familiarity with the platforms and this contributed to relax the learning atmosphere and make conversations flow naturally.

Extract 8: participants' conversations during the 2nd group/pair work activity of the task cycle.

L: Ok. Lo vedete adesso? *(shares her screen)* Ma stavo vedendo questo quadro *(drags the pointer on the painting and clicks on it)* e cercando di leggere le parole con questo…cos'è questo? *(indicates with the pointer one detail of the painting)* S: Una pergamena. […] Z: Sì. È anche un simbolo di ricchezza e anche perché non so, sembra anche molto savio. Perché è vecchio e vuol dire che ha visto molto. S: È un buon governante perché è grasso, vecchio ed istruito. *(everybody laughs)* Z: Eh ma questa è una conseguenza delle cose buone che ha fatto. E anche sembra	L: Ok. Do you see it now? *(shares her screen)* I was looking at this painting *(drags the pointer on the painting and clicks on it)* and trying to read the words on this…what's this? *(indicates with the pointer one detail of the painting)* S: It's a parchment. […] Z: Yes. It's a symbol of wealth also because I don't know, he also seems very wise. Because he is old, that means he has seen a lot. S: He is a good governor because he is fat, old and educated. *(everybody laughs)* Z: Eh but that's a consequence of the good things he has done. It also seems that he

che ha un bel stilo di capelli sulla faccia…cioè non sembrano un casino. S: Ho capito. Z: Sì, è ben tagliato. S: Ok, well groomed. *(everybody laughs)* Si presenta bene. L: *(zooms on the face of one of the characters and laughs, together with the others).*	has a good hair style…well, they do not look like a mess. S: Yes, I understand. Z: He is well groomed. S: Ok, well groomed. *(everybody laughs)* He presents himself well. L: *(zooms on the face of one of the characters and laughs, together with the others).*

Further confirmation of the level of students' confidence in using virtual platforms can be found in the tutors' feedback, who mentioned that, prior to the activities, students had used technology in online classes for long enough to be comfortable at using it in multiple learning situations.

Extract 9: tutor's observations of students involved in the 1st and 2nd group activity of the task cycle.

> They [the students] were perfectly comfortable at using technology. After a year of using *ZOOM* to attend classes online and doing group work, they knew how to use it well. As a consequence, it was easy for them to quickly learn how to use the other applications included in the activities.

Additional positive results of technological affordances on interdependence can be found in the results from the post-task activity. In fact, all students rated their confidence with technology as positive.

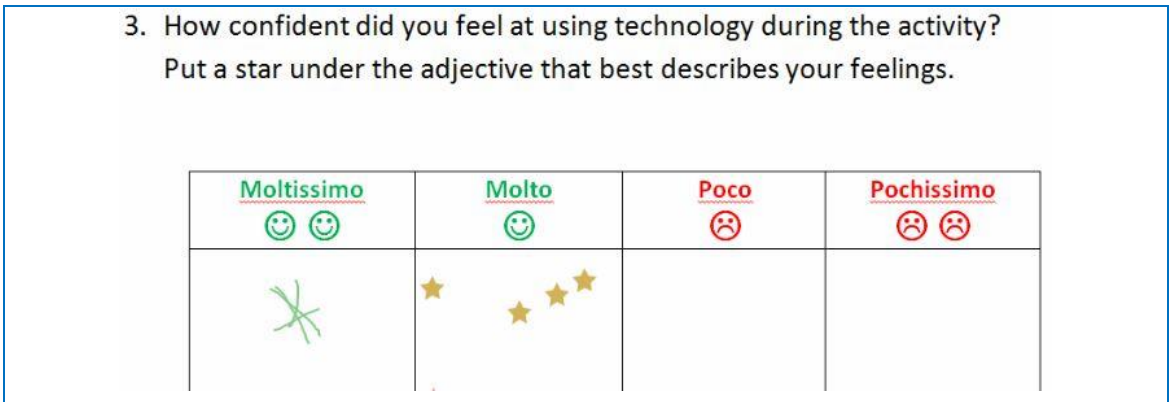

Fig. 35. Screenshot of students' responses to the post-task activity.

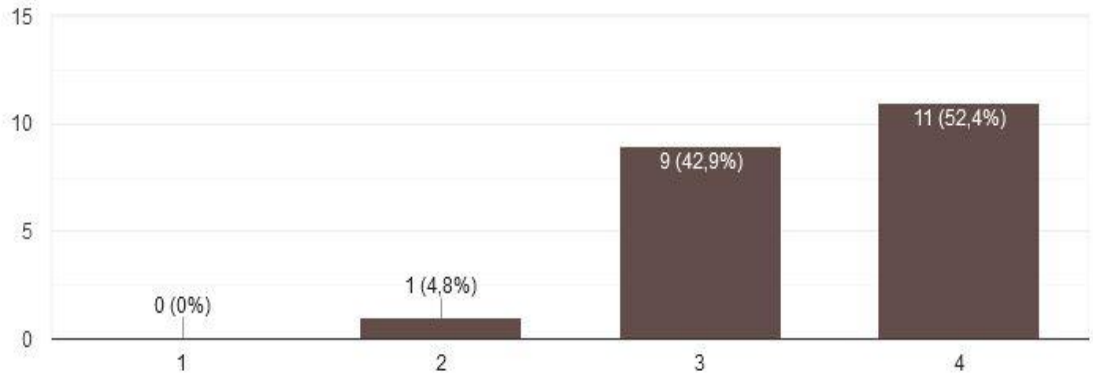

Fig. 36. Graph showing students' responses to the question: "did you feel that virtual environments stimulated interactions with your peers?" (1: not at all – 4: extremely)

In relation to group collaboration, students appraised technology to favour interactions with ease of navigation, for allowing content exploration and providing inputs for discussions from which negotiations and actions towards task goals originated. It is safe to assume that these elements, connected to the novelty that virtual platforms brought to the online class contributed to the overall enjoyment of the virtual activity. Confirmation of this can be found in the questionnaire responses.

Extract 10: students' responses to the survey's question "could you describe why you liked it [the activity]?".

[The activities] were really engaging, and allowed us to explore content individually whilst also giving us something to discuss altogether. In the task where we could decide on a painting, it was great as it allowed us to find our own examples, and then communicate our ideas with each other together.

[The activity was] much more interactive than a typical class and therefore more memorable.

It is nice to do something that we don't normally do.

I've enjoyed this activity since it gave me the chance to get in touch and collaborate with my peers which is something rare nowadays.

[The activity was] very different from what we usually do during our Italian classes and very interesting and good content.

Fig. 37. Pie chart showing students' responses to the question: "did you enjoy this virtual activity?" (yes/no)

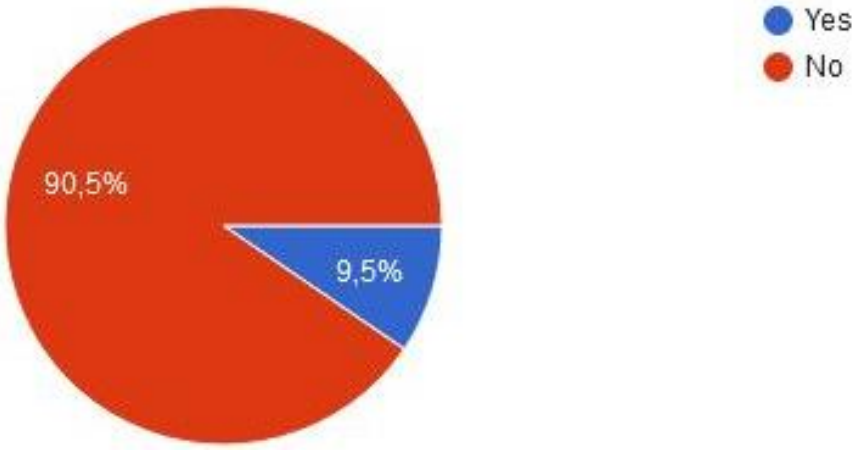

Fig. 38. Pie chart showing students' responses to the question: "before this activity, had you ever used virtual museums to create class content?" (yes/no)

However, technological proficiency and increased interactions did not necessarily imply facilitations in completing the tasks as a result of seeking clarifications. For instance, one participant found that using technological tools increased the difficulty of completing the activities as his reading skills were not judged fast enough to perform the task. Moreover, another participant would have preferred to have more information on the artwork and lexicon, which were not provided on *Google Arts & Culture*.

Extract 11: students' responses to the survey's question: "could you describe why you didn't like it [the activity]?".

I'm not the fastest reader so it was tricky to read the question then go to the virtual museum to find the answer, then click back to the quiz to see the answer options below and match it to a shape/colour on my phone. For me it was a bit of a faff.

I found this task quite difficult as I could not really find the right words to describe each figure, and I hadn't come across the pictures before, so had to Google them for more information.

Other students reported that activities done on *Kahoot!* and *Google Arts & Culture* hampered interactions because they created confusion and detachment. The student lamented distractions and not being given enough time to understand how tools operated. This suggests that if the activities were carried out in person, interactions might have been facilitated since students would have been able to understand instructions and compare their work. Other students expressed doubts on the efficacy of virtual museums for peers' engagement as it added existing pressure from tutor supervision and little time availability to complete the activities.

Extract 12: additional students' responses to the survey's questions: "could you describe why you didn't like it [the activity]?" and "could you explain why you think so [whether virtual museums were helpful in making you interact with your partners]?".

I found that when we were being supervised by the tutor, there was a bit more pressure to think on the spot, which made it difficult for me to process my thoughts on the paintings.

I found it a bit too gadgetty and time consuming. Especially trying to navigate content, tasks, tabs, phones, leaving a very little time to concentrate on Italian.

I found it a little confusing to interact with so many different websites and use *ZOOM* at the same time. I felt less connected to my classmates in navigating these other sites because there was less opportunity to simply talk to them and my attention was split between different activities. I enjoyed the content, but I think I would have been more comfortable with using images as a prompt for discussion rather than the structure of the activity. Too many programmes at once detracts from the lesson because the instructions required to operate the platforms need to be precisely followed which is difficult at a distance.

However, since interpretation of data collected led to overall positive results, it can be said that virtual museums facilitated students' interdependence by encouraging them to seek for clarifications on tasks, language and technology. In fact, once obtained the necessary clarifications, participants engaged in group explorations of virtual galleries, overcame the challenges of lacking face-to-face interactions by seeking solutions to efficiently reach their goals. This connects to negotiation and goal-orientation, which are two

further aspects of positive interdependence displayed by students using virtual museums in their task-based activities.

5.2 Negotiation

Interdependence surfaced as students negotiated their opinions and planned language use when motivating their group choices. For instance, in the examples below, students collaborated to find the best words to describe the paintings.

Extract 13: participants' conversations during the 2nd group/pair work activity of the task cycle.

L: Come si dice la *royalty* in italiano?	L: How do you say royalty in Italian?
Z: Eh, realtà.	Z: Eh, *realtà*.
L: Reali? Che è il sostantivo…Come si dice il *noun*? È un sostantivo no? O è spagnolo?	L: *Reali*? Which is a noun…How do you say the noun? It is a noun, right? Or is it Spanish?
Z: Di che parola stai parlando?	Z: Which word are you talking about?
L: No, I just want the word for *noun*. *(looks up the word online)* Reali è un sostantivo… Regali, regalità.	L: No, I just want the word for 'noun'. *(looks up the word online) Reali* is a noun…*Regali, regalità*.
Z: Sì, famiglia reale o reali come hai detto.	Z: Yes, *famiglia reale* or *reali* as you said.
A: In questo quadro c'è qualcuno che… Ehm...	A: In this painting there is someone who…Ehm…
B: Rappresenta? In questo quadro c'è un eletto e significa… Democracy?	B: Represents? In this painting there is an elect and it means…Democracy?
A: Democrazia.	A: *Democrazia*.
B: Ok.	B: Ok.
C: Ha…Come si dice *tie*?	C: He has…How do you say tie?
L: Cravatta!	L: *Cravatta*!
C: Cravatta…cravatta…	C: *Cravatta…cravatta…*

Students also informed their partners when using online dictionaries to search for words' meanings.

Extract 14: participants' conversations during the 2nd group/pair work activity of the task cycle.

B: Non so come dirlo…*The anchor*? *(switches to English)* Let me see. *(switches back to Italian)* Àncora, catenaccio. È scritto allo stesso di ancòra.	B: I don't know how to say it…The anchor? *(switches to English)* Let me see. *(switches back to Italian) Àncora, catenaccio*. It's written in the same way of again.
E: If we say *la diplomazia di*. What would the word for advice be? C: I don't know, let's look it up!	

Participants even involved tutors in their negotiations on language choice and in seeking deeper understanding of the artwork.

Extract 15: participants' conversations during the 2nd group/pair work activity of the task cycle.

L: Sai come si dice *progressive*?	L: Do you know how to say progressive?
A: Progressivo!	A: *Progressivo*!
L: Ok.	L: Ok.
A: No aspetta progressivo significa un'altra cosa penso…È un *false friend.*	A: No wait, 'progressive' means something else I think…It's a false friend.
L: *(says the researcher's name)* Tu lo sai come si dice *progressive* in italiano?	L: *(says the researcher's name)* do you know how to say progressive in Italian?
B: È molto bello questo sfondo con i fiori. Dove si trova questo quadro *(says the researcher's name)*?	B: This background with flowers is very beautiful. Where is this painting *(says the researcher's name)?*

Another form of negotiation surfaced as students co-constructed language together by spelling words, dictating and saying sentences out loud. As it can be seen from the following extract, students combined sentences by filling gaps in vocabulary with notions provided by their partners. Therefore, they helped each other find words, providing corrections when necessary.

Extract 16: participants' conversations during the 2nd group/pair work activity of the task cycle.

M: Did you find the word for advisors?	M: Did you find the word for advisors?
C: Consulente…No, probably consigliere sounds better.	C: *Consulente*…No, probably consigliere sounds better.
E: I just wrote amici. (*giggles*)	E: I just wrote *amici*. (*giggles*)
M: Molti consiglieri differenti…I consiglieri sono di culture…i culture?	M: Many different advisors…The advisors have different cultures…the cultures?
C: Le culture differenti.	C: Different cultures.
M: Ok. Quindi, questo quadro è un piccolo simbolismo, noi abbiamo due cani che significano *fidelity* and *trustworthiness*.	M: Ok. So, this painting is a small symbolism where we have two dogs meaning fidelity and trustworthiness.
E: I cani sono…	E: The dogs are…
C: I cani rappresentano *loyalty*. *Trustworthy* is affidabile. Rappresenta quindi il doge e l'affidabilità, per esempio?	C: The dogs represent loyalty. Trustworthy is *affidabile*. It thus represents the doge and trustworthiness, maybe?

Although the use of Italian did not prevent communication to take place at beginner levels, the greatest majority of students claimed that it did not ease interactions. However, given the fact that virtual museums were generally perceived as facilitators of interactions, they could have compensated for linguistic barriers.

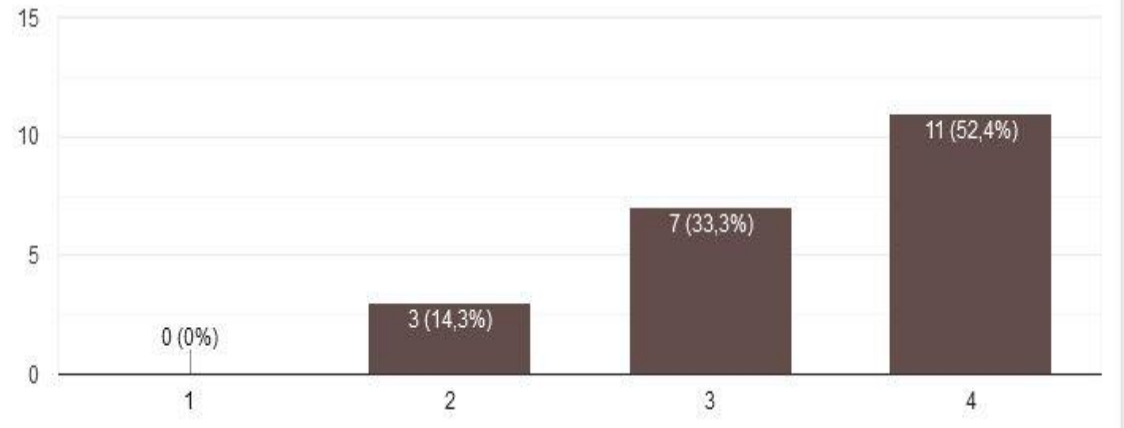

Fig. 39. Graph showing students' responses to the question: "were virtual museums helpful in making you interact with your partners?" (1: not at all – 4: extremely)

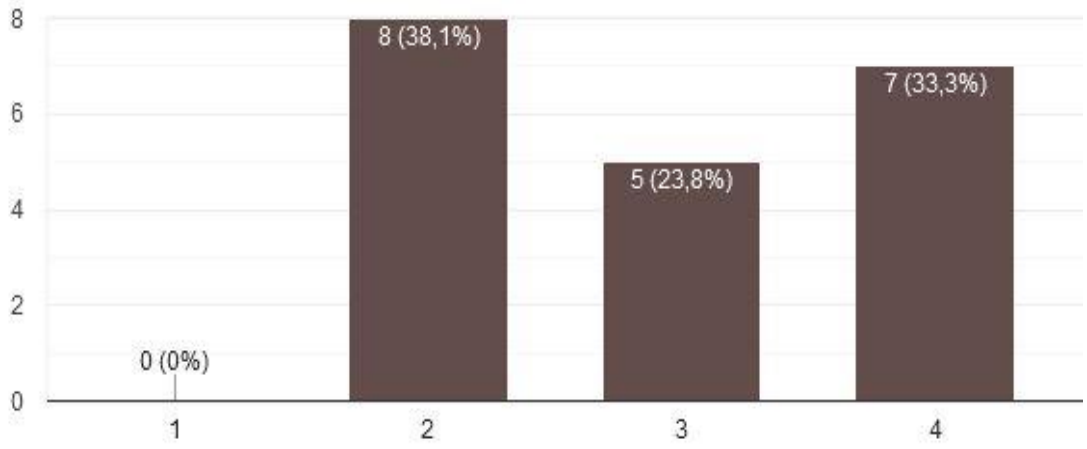

Fig. 40. Graph showing students' responses to the question: "do you feel that the use of Italian facilitated interactions?" (1: not at all – 4: extremely)

Students negotiated choices by asking for opinions and mediating contrasting views. Observations revealed that participants stated their impressions whilst simultaneously allowing their partners to contribute to the discussions.

Extract 17: participants' conversations during the 2nd group/pair work activity of the task cycle.

L: Solo una cosa da dire: al tempo poteva essere stato un buon governante ma adesso l'idea che il potere venga dato da Dio mi sembra un po' ambiguo, no? Come idea di buon governante… A: Sì sì, non l'ha ottenuto lui il potere… L: Cosa ne pensate voi dell'uso del colore, tipo quali colori usano? Perché io tipo stavo guardando i quadri in rosso *(uses the "sort by colour" tab on Google Arts & Culture)* e il rosso dà un senso di potere.	L: I just want to say something. At the time when it was made, he could have been a good governor but I find that nowadays the idea that power is given from God is a bit ambiguous, isn't it? As an idea of good governor… A: Yes, yes, he did not obtain his power… L: What do you think about the use of colours, like which colours they (the painters) use? Because I was looking at the paintings in red *(uses the "sort by colour" tab on Google Arts & Culture)* and red gives a sense of power.

In the extract below it appears that as soon as disagreements surfaced, one participant started to mediate between two contrasting stances.

Extract 18: participants' conversations during the 2nd group/pair work activity of the task cycle.

L: Pietro Grimani probabilmente stava nato in quella posizione ma Barak Obama doveva ottenere quella posizione…hai altri pensieri? (*refers to another participant)*	L: Pietro Grimani was likely to have had family in that position, while Barak Obama had to obtain that position…do you have any further thoughts? (*refers to another participant)*
A: Mah direi che comparando l'istruzione, Pietro Grimani era istruito per il suo tempo…	A: Mmm, I would say that by comparing levels of education, Pietro Grimani was educated for those times…
L: Ah right. Io penso che basta così.	L: Ah right. I think that's enough.
L: Veramente io non penso che il quadro di Obama sia serio, io penso che sia divertente.	L: Actually, I do not think that Obama is serious in that painting, I think he looks amused.
C: Nah, è molto seria!	C: Nah, he is very serious!
A: Beh allora diciamo che è una personalità direi liberale dai!	A: Well, come on, let's say that his personality is quite liberal then!

It is possible that students reverted to pre-acquired situational language scripts or enquired for their partners' opinions when compensating for lacking ideas or wanting to disengage from debates. However, conversations appeared to flow naturally with quick exchanges of information. Similar perceptions were felt by one of the tutors, who claimed that some of the students talked spontaneously and maintained high levels of interest throughout the activities.

A crucial aspect of negotiations was turn-taking since observations revealed that students generally abided to it when interdependence was established with opinion enquiries and choice mediation. It also appeared that respecting turn-taking stimulated students to interact more. On this matter, one of the tutors observed increased oral production in individuals who had normally been quiet in previous classes, mentioning that conversations flowed easily and that students allowed each other time to speak.

Extract 19: tutor's observations of students involved in the 1st and 2nd group activity of the task cycle.

Turn-taking was respected. It was interesting to see how a student who is not usually loquacious spoke a lot during the session whilst normally it is definitely not her who initiates a conversation during language activities. You could clearly see that she was

using Italian much more than usual. She did not stop talking even when she made mistakes.

Further confirmations of this statement can be found in the questionnaire results, where students perceived that they allowed space to their peers to provide meaningful inputs to conversations, without making them feel talked over. This contributed to foster equality in reaching group goals, ensured that all contributions were valued in negotiations and that group choices resulted from collective efforts.

Fig. 41. Pie chart showing students' responses to the question: "do you feel that you allowed your partner enough time to speak during conversations?" (yes/no)

From a qualitative analysis of students' responses, it appears that students positively valued virtual museums as enhancers of negotiations. During focus groups, when describing how virtual museums helped them interact with their partners, students claimed that they fostered communication with each other and encouraged them to ask questions that were beneficial for the whole group.

All in all, results show that negotiations were performed to choose one painting amongst the selection offered by the museum's virtual galleries in consideration of participants' opinions and language use. This was particularly relevant for participants' interdependence as contributions appeared to be instrumental to reach group objectives. Consequent students' actions were goal-oriented and implied goal-assignment and turn-taking, which created situations of goal interdependence linked to sense of ownership, fulfilment and satisfaction.

5.3 Goal-orientation

After initial clarifications, the majority of students displayed strong goal-orientation by directing collective actions to reach task objectives. Some groups reacted by assigning

roles to group members, others shared responsibilities on more equal basis. Both scenarios implied the merging of instrumental and emotional bonds between participants resulting in interdependence between leaders and followers.

Extract 20: participants' conversations during the 2nd group/pair work activity of the task cycle.

M: Who is going to do the presentation? I can't do it today. I had a whole morning with doctors… *(says the name of one of the participants)* Would you do take over please?
C: Ok, I'll do it!

M: *(says the name of one of the participants)* Are you writing everything down for the presentation?

E: Yes, most of it! Anything else? Maybe the beard is a sign of wisdom?

Apart from the two cases mentioned above, leaders and followers' role assignment happened implicitly. In particular, leadership surfaced with acknowledgements of leaders' strong opinions in directing group choices. Moreover, it was observed that leadership did not harm participants' sense of fulfilment and satisfaction with their final choices. In fact, in situations where followers and leaders had similar language proficiency levels and topic knowledge, followers' contributions were valued by leaders and both parties perceived to be attaining goals on equal terms. During focus groups, participants claimed that agreement happened spontaneously as a consequence of feeling equal with their partners and comfortable at working with them. This could explain why strong disagreement did not surface during discussions and implied that the majority of participants felt satisfied with their group choices.

Extract 21: participants' conversations during the 2nd group/pair work activity of the task cycle.

H: From my experience with *(says the name of one of the participants)*, I felt in sync with his ideas. They were good and when he proposed his ideas, I agreed with him without feeling obliged to do so.
I: I felt exactly the same. I felt we were equal.
B: We did the same in our group, we answered together, it was nice.

A: At the beginning when we were still discussing the painting to choose, I got the idea whilst we were still deciding what to do.

L: Yeah, but yours were good ideas. Also, it was very easy to interact and everyone gave its own input. It's much easier to interact with a person with a good level of the language and feel equal with him or her.

Leaders who provided suggestions were more inclined to abide to turn-taking and let group opinions surface. This permitted interactions to proceed on equal terms as participants negotiated agreements on the final painting choice. Leaders added their contributions to opinions previously stated by their partners, thus affirming their lead whilst valuing individual inputs. As it can be seen from the extracts below, leaders' roles shifted to their followers as soon as they made sensible interventions. In other words, students won leadership by proposing convincing statements that determined the final group choice. However, interdependence was still maintained in the form of mutual reliance until the tasks were completed.

Extract 22: participants' conversations during the 2nd group/pair work activity of the task cycle.

H: Però abbiamo detto che è un aristocratico e quindi in teoria dovrebbe avere soldi. Però hai ragione, non sembra molto ricco.	H: But we said that he is an aristocrat and thus in theory he should have money. But you are right, he does not seem very rich.
I: Possiamo dire che è come un aristocratico ma che non è il più importante per la sua epoca.	I: We could say that he is like an aristocrat but he is not the most important one for his times.
H: Esatto, esatto! *(nods his head)* Allora modifico quello che abbiamo scritto prima?	H: Exactly, exactly! *(nods his head)* Should I then modify what we have written before?
I: Sì.	I: Yes.
I: Oh! Guarda quello…sembra un po' sul mezzo. Quello che si chiama *Venetians conquer Gallipoli*. Ah. Condivido lo schermo.	I: Oh! Look at that one…the one in the middle. The one called *Venetians conquer Gallipoli*. Ah. Let me share the screen.
H: Sì grazie.	H: Yes, please.
I: È come sul mezzo… *(uses the pointer to indicate a painting on the shared gallery)*. Qua.	I: He is like in the middle… *(uses the pointer to indicate a painting on the shared gallery).* Here.
H: Ah sì, bella.	H: Ah yes, nice.

I: È come che il governante è con il popolo. E non vanno soli…Il popolo. Il governante va con loro.	I: It is like as if the governor was close to its people. And they don't go alone…The people, I mean. The governor goes with them.
H: Esatto, sì, ok. Possiamo usare questo.	H: Exactly, yes, ok. We could use this one.
I: Questo o l'altro che abbiamo detto prima?	I: This one or the one we mentioned before?
H: Questo mi piace di più. Ha più significato.	H: I like this one better. It is more meaningful.
I: Ottimo. E dobbiamo dire qualcosa?	I: Great. Should we say something about it?
H: Eh, penso che diciamo solo se lui combatte insieme al popolo.	H: Well, I think we can only say that he is fighting together with his people.
I: Sì mi piace.	I: Yes, I like it.
H: Quello va bene.	H: That one is good then.

Therefore, increased perceptions of ownership of the final painting choice resulting from these interactions surfaced from shared contributions to the final goal. Regardless of leadership patterns, individuals' sense of fulfilment appeared to be sustained by their enjoyment of the activity and by their perceived usefulness in reaching activity goals. Extracts from focus groups and answers to the questionnaire confirm these assumptions. In fact, participants positively rated their satisfactions with group choices as they perceived them close to their points of view and considered them the product of collective work.

Extract 23: students' responses to the survey's question "in which way do you think that collaboration with the group made it easier to reach the activity goal?".

My partner had a good idea and therefore made the final choice on the painting (but I still agreed with them).
My partner was able to find a very representative painting and I was able to contribute given my personal interpretation of the artwork.
I thought the painting we picked reflected our ideas.
I spoke a lot in the group rooms, and guided the discussions.

I gave an idea which my partner really liked so we ended up choosing that painting.

We all worked together and it was a good atmosphere. I can be quite direct but the others held their own. I felt like it was a productive session.

We came up with lots of interesting ways of looking at it.

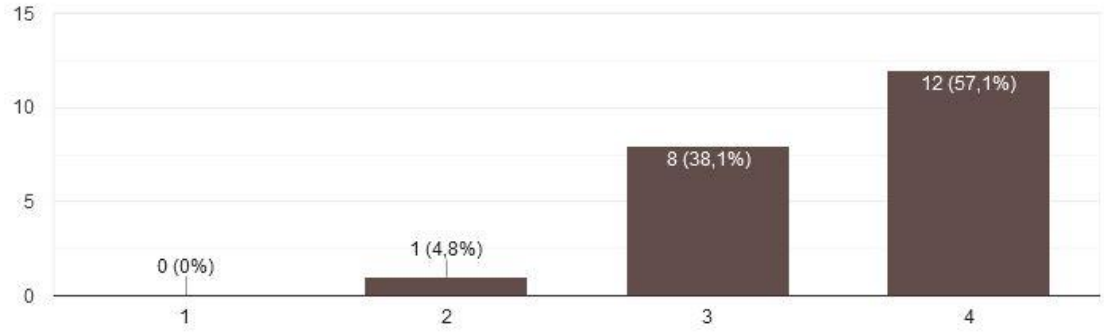

Fig. 42. Graph showing students' responses to the question "did you feel satisfied about the painting that your group chose?" (1: not at all – 4: extremely)

Despite these positive results, when describing the perceived sense of ownership of the final painting choice, the number of participants stating that it was the result of their own decisions was slightly higher than the one of those who declared it was their partner's choice.

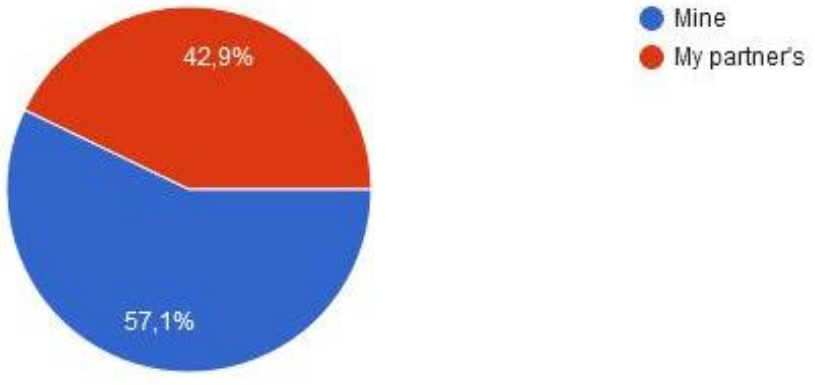

Fig. 43. Pie chart showing students' responses to the question "would you describe the choice of painting as more "yours" or more the result of your partner's contribution?" (mine, my partner's)

It would thus appear that the dynamics of leaders-followers interdependence in goal-orientation were dependent on temporal dimensions. In fact, participants who quickly proposed their ideas perceived higher sense of ownership, while followers recognised them as leaders without necessarily feeling useless in contributing to reach goals as long as they were allowed to express their opinions. In other words, mutual dependence

was nurtured by permitting exchanges of ideas regardless of leading roles. Moreover, interdependence appeared as leaders considered followers instrumental to reconfirm their opinions and direct group goals towards leaders' choices. Further confirmation is provided by the fact that leadership acknowledgement and partners' approval appeared to be parameters of satisfaction amongst individuals who oriented group goals to their choices.

Extract 24: students' responses to the survey's questions "do you describe your partners' choice as more yours or his?" and "could you explain why you felt satisfied/dissatisfied?".

I chose it initially and explained my view to the group and they agreed with me!!

I chose this painting first, as I had made my mind up before the other members in my group.

I showed the painting at first, and after a comparison with a few more, we ended up collectively choosing mine.

Because it was my initial idea and it represented my opinion, and I was glad others agreed with me, even a person from another group.

Satisfied of my own choice ahah and had good explanations with it, my group also had different views and opinions.

It is possible that students' attitudes towards leadership were based on past group work experiences. In fact, they might have been more inclined to display leader-follower relationships according to past successes on task performance. For instance, followers might have tended to agree with those who had demonstrated strong leadership and achieved task goals in previous classes. Unfortunately, it is not possible to discern from this study the impact of previous learning experiences on interdependence bonds as results describe a situation instead of the outcome of a learning process. However, future developments might include further explorations of the interdependent connections between leadership and goal-orientation.

From the results stated above, it appears that lead-taking conducted to successful situations of positive interdependence when leaders' actions were directed towards group goals. Followers were consequently more inclined to agree with leaders as their opinions

coincided and leaders felt that their decisions were effective for goal attainment. The resulting participants' focus on goals and mutual dependence created an increased sense of ownership and self-fulfilment.

However, it also appeared that overt leadership had detrimental effects on goal orientation as contrasting opinions and disagreements surfaced. This resulted in low interaction levels as participants did not express their opinions and leaders directed group choices without looking for followers' approval. Consequently, sense of ownership and satisfaction levels were lowered. For instance, one participant expressed dissatisfaction with the activity as "the reasons mentioned for choosing that painting were not representative of my personal values". Although this might have been the result of failed negotiations, we can assume that this person's contributions were nullified and interdependence failed.

Extract 25: students' responses to the survey's question: "Could you explain why you felt satisfied/dissatisfied [with the activity]?".

I think the term "buon governante" is very subjective to the time period, so I feel the painting we chose reflected what this phrase would mean to someone in the 1700s but not so much to someone of today. Therefore, it is difficult to comment on whether I'm satisfied/dissatisfied.

The reason for choosing it made sense but I don't feel like I have a good enough knowledge of Italian history to understand the paintings well enough to give a proper answer.

The reasons that we mentioned for choosing that painting were not representative of my personal values for a good leader.

On the same matter, as it can be seen from the extract below, the tutor noticed that while in some cases participants voiced their disagreement, in other instances they reacted by displaying total silence.

Extract 26: tutor's observations of students involved in the 1st and 2nd group activity of the task cycle.

Sometimes people did not interact. Everybody seemed lost in their own things. For instance, one student initiated a conversation but then the others did not reply. Maybe they had already conversed, it is just that when I entered the room there was total silence. I

also said “please talk as I need to write something!” so one of them spoke a little. Perhaps the painting choice was made only by one of them, whom I actively saw doing research on a painting and explaining his reasons for choosing it.

Refraining from interacting might have also been a result of shyness, fear of making mistakes or lack of interest and motivation. For instance, one of the tutors reported that one student appeared to be shy and scared of making mistakes which resulted in consequential difficulties for partners’ interactions. The fact that she had been paired with someone who was a fluent Italian speaker limited her speaking potential. Despite having the ability to express her points of view in Italian, the tutor mentioned that “opinions were not spontaneously coming from her”. This linked to motivational loss and absence of positive interdependence. On this matter, the tutor observed that since this activity was done as part of the students’ weekly classes, students’ participation was motivated by obligation rather than interest to participate. Students’ inabilities to choose to take part to the activities and potential lack of interest in the topic discouraged them from interacting with others. Consequently, the stimuli provided by virtual museums did not trigger interdependence.

Overall, it can be positively asserted that one of the effects of virtual museums on positive interdependence was supporting participants’ goal-orientation. Engaging with virtual galleries triggered social behaviours as groups organised their actions to reach task goals as effectively as possible. This included respecting turn-taking in order to display all the available points of view on the virtual paintings included in the galleries. Another effect was role-assignment which created leader-follower interdependence; followers relied on leaders as they directed groups to personal choices which were also identified by followers as their preferences. However, one drawback of this phenomenon consisted in leaders using followers as instruments to confirm their opinions and direct group decisions. Thus, task goals coincided with leaders’ personal objectives, fulfilment and sense of exclusive ownership of group choices. Other factors behind lack of interdependence in goal-orientation were not directly linked to the use of virtual museums. These elements consisted in participants’ motivation and interest in the topic, whose effects on interdependence have not been included in this analysis but might constitute further areas of investigation.

5.4 Concluding remarks on the analysis

From this analysis it can be said that virtual museum activities created positive interdependence amongst students. In fact, the great majority of students engaged in meaningful interactions perceiving others as instrumental to complete the activity goals. Whether these perceptions translated in leader–follower interdependent behaviours or perceptions of equal roles in decision-making, the use of virtual museums in language learning activities has led to interdependence surfacing as cooperation, negotiation and goal-orientation. This has been confirmed by a combined analysis of focus group interviews, questionnaire results and classroom observations. Negative results in the establishment of positive interdependence amongst students during virtual museum activities were linked to external factors such as participants' motivation and interest in the topic. Additionally, whilst a significant number of participants enjoyed exploring the affordances of virtual museums and used them to facilitate online interactions with their peers, other participants displayed hesitation and discomfort at utilising digital resources for task interactions. While this can be accounted for being the result of individual reactions to first-time exposure to the platforms and personal motivation to complete the activities, it is also true that personal dispositions towards technological affordances need to be considered when assessing interdependence arising from language activities based on virtual museums.

Overall, the use of virtual museums in online language classes of Italian was praised by the students for its novelty as well as for enhanced possibilities of interactions, collaborations and discussions. Final remarks provided by students and tutors confirmed that the use of virtual museums made it possible to reach unprecedented levels of interactivity compared to previous online classes. Moreover, some students demonstrated interest in integrating virtual museums in future language activities as these platforms triggered their curiosity for Italian art. It also appeared that digital collections offered an informal virtual space where students could explore topics with added XR interactivity.

In sum, virtual museums encouraged students to think creatively and enhanced their problem-solving, cooperation and negotiation skills. Students' comments from the questionnaire confirm these findings.

Extract 27: students' responses to the survey question "why did you enjoy the activity?".

> It was interesting and interactive, and I enjoyed the themes that we covered. It would have been interesting to learn more facts about art history, and I enjoyed learning more about the details in the portrait of Obama. It is always enjoyable to practice Italian in a more

informal setting, and the subjects that we covered were different to those we usually discuss in class. I enjoyed using *Arts & Cultures*, as someone mentioned in the focus group it was a good opportunity to "viaggiare online".

I enjoyed it because we had to think in a creative way to find the most appropriate way. The game was not only about the Italian language but also about the culture and art.

Despite encouraging results confirming that the use of virtual museums contributed to enhance students' participation, negotiation and goal orientation, from an analysis of participants' responses to the appreciation of virtual tasks, it appears that strong preferences were generally given to gamified activities. Specifically, given that the playful activity dimension was provided by the platform *Kahoot!* integrated with *Google Arts & Culture*, general preferences were confirmed for game-based activities fostering engagement and competition rather than group interactions (Fig. 44). However, since 36% of the students indicated *Google Arts & Culture* as their preferred activity, it can also be assumed that participants appreciated virtual museum contents and connected them with the possibility to interact with their peers in interdependent modalities.

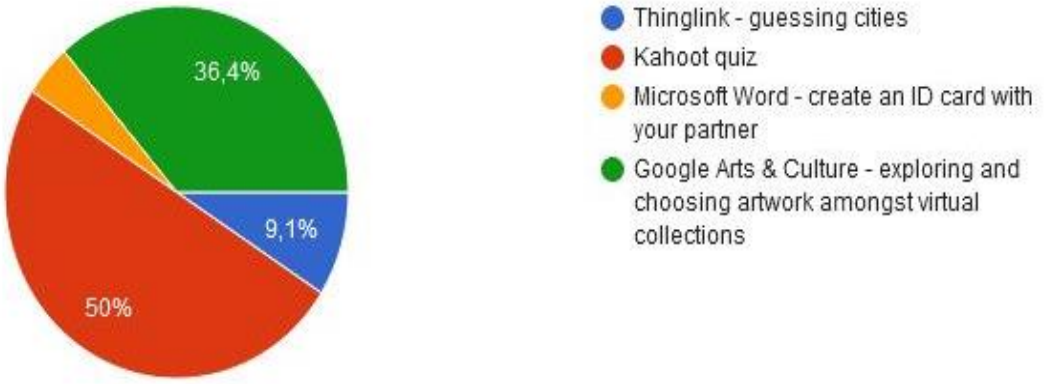

Fig. 44. Pie chart showing students' responses to the question: "which part of the activity was your favourite?"

By analysing the open-ended answers motivating the reasons behind students' preferences, it was possible to identify the motivations behind students' preferences for *Kahoot!*

Extract 28: students' responses to the survey question "could you describe why you liked it [the activity]?" - answers referring to preferences for Kahoot!.

Nice to interact virtually from my phone to the quiz!

It was fun and interactive.

[It was] very competitive.

Learning with the motivation of the competition is quite entertaining, it actually makes me wanna learn more.

Preferences for the activity *Google Arts & Culture* revealed that a recurring element behind students' liking consisted in the dimension of interactivity provided by the time spent interacting with peers. This supports the successful establishment of positive inter-dependent relationships amongst participants thanks to the use of virtual museums.

Extract 29: students' responses to the survey question "could you describe why you liked it [the activity]?" – answers referring to preferences for Google Arts & Culture.

It was creative, and we got to spend more time interpreting a specific painting. I also liked that we were challenged to write a presentation in Italian.

This activity offered the most opportunities to speak, debate and learn vocabulary. I find it easier to have more freedom to use the vocabulary I know in discussion rather than answering questions that are too narrow or precise.

Good to think through the art and then to relate the content back to the wider group.

I liked the freedom of choice to be able to talk about what I found interesting. I could practice my grammar and expand my range of vocabulary in terms of describing class, power and politics.

It pushed us to think creatively rather than passively participating, and it was entertaining due to its being visual.

I liked being able to navigate through different colour schemes as I think using colour as a way of grouping pictures makes it easier to find an image to fit whatever meaning you need it to fit.

It was a fun, interactive task, which helped with how to use *Arts & Cultures* and also found out something interesting.

It was very interesting to learn about Venetian art history, especially about the symbols of the city. *Google Arts* was easy and interesting to use, and the *Kahoot!* quiz was a fun way to test our knowledge.

Conversely, little appreciation was given to tasks completed on *ThingLink* and Microsoft Word, which offered limited interactivity. When motivating the reasons behind such dislikes, most students claimed the activities were too easy and not very stimulating.

Therefore, the interventions' efficacy of fostering students' interdependence was only reached when the activities combined task challenge with stimulating platform visuals.

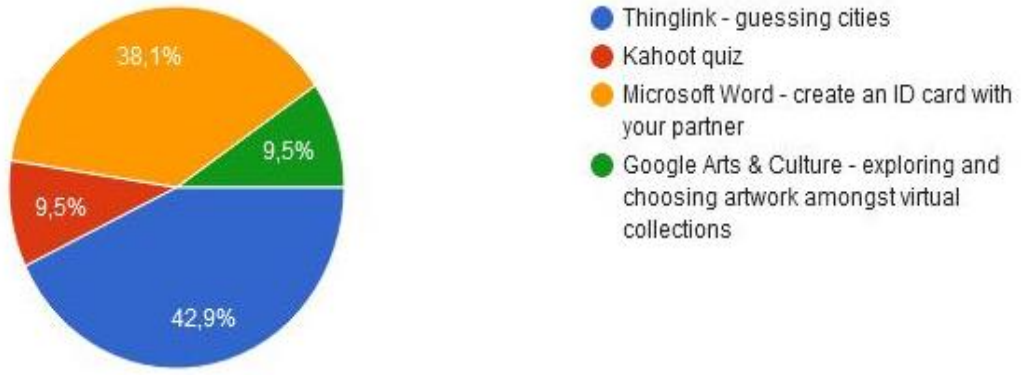

Fig. 45. Pie chart showing students' responses to the question: "which part of the activity did you like the least?"

When analysing tutors' comments on the impact of the activities on students' interdependence, their opinions were positive and suggested that they would be willing to integrate virtual museums in the language curriculum.

Extract 30: tutor's observations of students involved in the 1st and 2nd group activity of the task cycle.

I think it has been good for them to do something new, which is definitely something this activity provided. […] Doing something different is like a breath of fresh air to them.

A final remark can be made by looking at Fig. 46 presenting tutors' observations on students' interdependence during the activities. Overall, tutors noticed pro-social and interdependent behaviours surfacing in the greatest majority of participants.

Frequency of interdependence patterns observed in students' interactions		
	The University of Manchester[1]	**King's College London**
Students let partners speak	4	4
Students ask for their partners' understanding on what to do.	1	2
Students speak first during conversations.	3	2
Students respect turn-taking.	4	4
Students ask their partners for word meaning in Italian.	2	1

[1] The observations collected at University of Manchester were only based on the students who gave their consent for data collection.

Students ask for their partners' opinions.	4	4
Students are involved in conversations.	4	3
Students demonstrate interest in group work.	4	3

Fig. 46. Table containing tutors' observations on students' interdependence.

As a consequence of these results, it can be said that the effects of virtual museums on students' interdependence fostered students' interactions despite being prevented from seeing each other in person. The enhanced interactivity provided by virtual museums sets encouraging prospects for further developments in the use of XR technologies in online language learning focused on strengthening students' interdependence. Despite the fact that platforms were not designed for being language learning material, the results of this study could provide future directions for fostering students' mutual reliance in online language activities. In other words, interdependence-enhancing virtual activities could contribute to lower potential social disengagement in online language learning spaces by strengthening students' bonds of interdependence and cooperation. Further discussions on these results will be provided in the following chapter.

CHAPTER 6. DISCUSSION

The interventions highlighted that positive interdependence surfaced as students utilised virtual museums to achieve joint activity goals. In fact, participants' interactions were strongly goal-oriented and confirmed the hypothesis that the use of virtual museums can contribute to foster mutual reliance in online language learning contexts. Furthermore, behavioural patterns previously identified in the literature as potential triggers of interdependence also appeared. Additionally, data from questionnaire results, focus groups and tutors' interviews revealed potential new aspects of interdependence not previously examined in the literature which could outline future directions in the use of virtual museums as tools for language learning.

In this chapter, results will be reviewed in consideration of the existing literature and data analysis. Limitations to this study will be examined with particular reference to activity design, time allowed for planning and completing the activities, students' language proficiency and associated technological constraints.

6.1 Review of the findings

6.1.1 Clarification seeking

A significant finding of this research consisted in underlying how students sought for clarifications as a preliminary move for successfully establishing interdependence amongst participants and as a prerequisite for initiating group activities.

Related to virtual museums in their potential of being facilitators of goal-attainment, clarifications were sought for as individuals attempted to understand task affordances to reach target goals quickly and efficiently. Despite the fact that instructions were provided to the students in the form of spoken indications and visual prompts, it is possible that due to the necessity of using virtual museum tools in the activities, students perceived indecisions and consequently needed to clarify instructions with people they knew and trusted. In fact, participants were observed to clarify to each other whether their understanding of the activity instructions was correct (Extract 1; Extract 2; Extract 3). Overall estimations on the activities' duration revealed that students who clarified instructions reduced the time they took to complete the activities. Clarifications were also a moment

for students to monitor participants' personality cues useful to assign task roles in subsequent activity stages. In other words, interdependence surfaced as individuals helped each other to reach activity targets by establishing a common ground from which actions could depart from. Only when students obtained clarifications on the instructions to follow at each activity stage, negotiations and goal-oriented language use started to unfold in the interactions (Extract 1; Extract 6; Extract 7). This can be considered as evidence of the joint dependence and covariation of interest postulated by Rusbult and Van Lange (2003) and Kelley et al. (2003), which surfaced in language clarifications and activity instructions. In other words, clarification seeking contributed to create the conditions for the appearance of congenial interactions, positive emotional experiences, cooperation and trust, setting the conditions for interdependence to appear amongst interacting students. Consequences of clarification seeking also include reinforcement of self-image, self-determination and self-confidence which contributed to strengthen autonomy and individual control of the learning process to enhance group negotiations and goal-targeted interactions. These findings confirm what Dörnyei (1994), Nguyen (2016) and Loh and Ang (2020) identified as facilitatory conditions of group interdependence.

It was also noticed that whenever a clarification stage was not included in the interactions or appeared not to have reached satisfactory levels, interdependence was less likely to surface (Extract 3; Extract 12). In fact, when instructions were not clarified amongst group members, confusion and uncertainty emerged at later stages in the activities and impacted the quality of interdependent relationships. As demonstrated by negative judgements on the activities conducted with *Google Arts & Culture*, participants felt they had lost time trying to understand how to use virtual museums for the purpose of achieving task goals (Extract 11). While it is true that no training on how to use virtual resources was provided, students did not spontaneously voice their doubts on what to do prior to starting the virtual museum activities. In other words, when students restrained from sharing their uncertainties on task instructions and how to use virtual museums in the activities, interdependence was less likely to appear with associated decreases in negotiations, role-assignment, leadership patterns and use of Italian. This also emerged from tutors' comments on absences of students' interactivity (Extract 26). Conversely, when individuals sought for clarifications, interdependence was more likely to appear in the course of interactions since students seemed to collaborate towards goal attainment and preferred to use Italian instead of English to communicate (Extract 2; Extract 23). Overall, while it can be assumed that the establishment of positive interdependence between group members was also dependant on motivation, personal interest and group dynamics, it is also true that clarification seeking played an important part in contributing to establish

bonds of mutual reliance between the students lasting for the duration of the virtual museum activities.

6.1.2 Negotiation

Consistent with findings from the literature, results demonstrated that negotiations arising from the use of virtual museums generally favoured interdependent interactions. For instance, students commented on their peers' preferences and expressed their opinions on the virtual collections displayed on their screens (Extract 2; Extract 18). Additionally, in the first part of the task cycle it was noticed how students negotiated a way to jointly work on activity contents, choosing to share screens and upload documents on *Google Drive* so that both parties could edit them. As it can be seen from increases in interactional exchanges of opinions and points of view on the paintings' characters, this strategy enabled participants to organise their work and ensure active participation, quick information retrieval and painting selection (Extract 6).

With regards to activity content, in the 1st part of the task cycle students negotiated how to best describe the characters' behaviours in the two paintings on their Word documents. They were noticed to exchange opinions on the characters, compare paintings' characteristics and expand their observations beyond symbolic representations, making connections with the contemporary world. This was favoured by the fact that opinions on the characters' physical and background information generally converged, whilst negotiating the vocabulary to insert in the tables. In the 2nd part of the task cycle, centred on the utilisation of *Google Arts & Culture*, students continuously refined their contributions to the painting selection and jointly constructed the best way to achieve it. Because this activity was less structured than the previous one, negotiation opportunities increased with students' chances to mediate between different opinions.

Negotiations also implied that students allowed each other time to speak and respected turn-taking. In fact, although there were cases when students spoke over other members' contributions, it can be said that before counterarguing to their peers' statements, participants generally waited for partners to complete their sentences in Italian, even when word production rates were slower than native language production (Extract 18). This ensured the establishment of interdependence-fostering interactional strategies contributing to make goals the results of mutual efforts and confirming what was theorised by Baker (1994) as dialogue-enhancing negotiations and respect of turn-taking as

modalities to reach agreements. This included signalling whenever individuals used digital resources or features of *Google Arts & Culture*, edited documents, shared their screens and encouraged their partners to follow suit (Extract 14; Extract 18; Extract 22; Extract 23). These findings confirm that the convergent nature of the activities generally promoted collaboration, social engagement and negotiations of meaning, which are factors defined by Duff (1986), Skehan (2001) and Dao (2019) as enhancers of group interdependence.

Further observations revealed that some participants used negotiations to value personal contributions while selecting the most relevant inputs for goal attainment. However, this also enhanced students' tendency to take control over their partners' decisions. In fact, in the second part of the task cycle, a good number of students identified the painting choice as the result of their own decisions and ability to direct groups towards their choices, instead of considering the role of partners' contributions in it (Fig. 43). Counterbalancing results can be identified in Fig. 42, which shows that students were generally satisfied of the paintings selected within their groups. This process was usually conducted by the activity leader, whose role was maintained for the whole length of the activity or switched between participants (Extract 18; Extract 21; Fig. 41).

All in all, these behaviours confirm that negotiations were successful manifestations of interdependent behaviours triggered by the use of virtual museums. Furthermore, together with goal-orientation and negotiations, they highlighted the importance of leader-follower relationships in organising and conducting group-work for successful goal attainment.

6.1.3 Goal-orientation

Once prompted with instructions, participants quickly orchestrated their actions towards a quick and efficient goal attainment. By doing so, some group members took the lead and provided guidance to their followers on the painting that according to them best corresponded to the given theme, or on whether they had identified the most pertinent information to complete the ID card of a "good governor".

While in some cases leadership was maintained throughout the activities, in other instances it was assigned to followers whose inputs and points of view provided new directions for completing the tasks (Extract 18). In these instances, newly-appointed leaders supported followers' decisions by agreeing with their statements. In fact, by observing

satisfaction levels and students' positive comments on perceptions of group equality (Extract 21), it appears that responsibilities were shared between group members thanks to interdependent relationships, which encouraged weaker participants to be active agents of task-attainment. This provides meaningful evidence of the type of transformational leadership mentioned by Lu, Liu and Huang (2020) since the creation of interdependent bonds generated the conditions for individuals to mutually support each other, develop confidence as well as team-working and communication skills. It is very likely that the emergence of these interdependent behaviours was facilitated by the use of virtual museums, since they enabled participants to reach high levels of engagement and interactivity. In fact, an analysis of participants' conversations highlighted that students were cautious not to stand out from group interactions by talking over their peers and asking for their opinions (Extract 18). This can be interpreted as a way to reduce the salience of their statements and enable the emergence of opinions adding new perspectives to group orientations and increasing the efficacy of reaching target goals. Despite the impossibility of seeing students' screens and monitoring eye-tracking measurements, observations of students' facial expressions and gaze directions have revealed that participants supported their opinions by navigating the virtual galleries of *Google Arts & Culture*.

However, there were also cases of unbalanced leadership emerging from students' interactions with virtual museums. For instance, there were individuals who maintained their leading roles throughout the activities, attempting to make group decisions converge with theirs. It was observed that these leaders exploited followers' subdued dispositions to assign transcribing roles to them and reduce their decisional power (Extract 20). By referring to the findings of Deutsch (1949a), these appear to be signs of negative interdependence as leaders acted to increase their productivity and obstruct other participants' chances of communication. However, despite these findings, it is strongly believed that the emergence of these aspects was due to personality and motivational traits as well as of group dynamics rather than being the sole consequence of virtual museum usage. In fact, strong leaders appeared to be less inclined to utilise virtual museums as a tool for goal attainment and tended to deploy their personal knowledge of art history as a way to support their statements and guide groups towards the final painting choice (Extract 20). Since the majority of participants had worked together prior to these activities, it can be assumed that they knew each other's expertise and language proficiency and that they based their actions on them. Therefore, topic knowledge and strong linguistic skills appeared to have fostered individual accountability and replaced the utilisation of virtual museums as tools to attain activity goals. It can be hypothesised that personal accounta-

bility was used to conceal from other group members a sense of inadequacy at using virtual museums, which were perceived by leaders as a time-consuming activity hampering their roles. These are assumptions deriving from observations of student' behaviours and from an analysis of focus groups, tutors' interviews and questionnaire's answers, although further investigations would be required to prove their validity.

Despite its anonymity, given the chronological completion of the questionnaire by the students, it was possible to identify the correspondence between group leaders and the answers they provided. In particular, observations revealed that individuals who restrained from using virtual tools for goal attainment were confident leaders at influencing goal orientation with their expertise and language proficiency (Extract 20; Extract 24). Conversely, leaders who felt comfortable with technological tools were more likely to allow for followers' decisional power to emerge in directing group actions and therefore promote interdependent relationships, using language and subject expertise to support other group members. Consequently, observations have highlighted how interdependent relationships arising from the use of virtual museums are strongly dependent on language and technology use (Extract 18; Extract 21).

6.1.4 Language use

An element of particular interest was observed in the relationship between interdependence and verbal/non-verbal language use. In fact, despite the interactional limitations of online environments, students made large use of non-verbal skills such as hand gestures and facial expressions which contributed to clarify meanings to their peers. Non-verbal language seemed to be essential to convey meanings, provide clarifications and signal important actions just as if the participants were communicating face-to-face (Extract 2). This also indicated that screens appeared not to hamper the emergence of interdependent behaviours of negotiations, goal-orientation and seeking for clarifications. This supports the assumption that interactions in virtual spaces may become digitally routinised and help construct social activities within language learning processes (Bruce & Levin, 1997; Thorne, 2016; Morchid, 2020).

With regards to the specific utilise of Italian, data suggests that highly-proficient individuals interacted more in Italian than less skilled students (Extract 2; Extract 20). It also appeared that the utilisation of virtual museums enhanced students' opportunities to interact in the language. In fact, students were observed to study the pictures and describe them in Italian even when their vocabulary and grammar knowledge were limited (Extract

14). While this might be due to students' awareness of being involved in language activities, observations of students' behaviours, even at beginner levels, revealed increased linguistic production in Italian prompted by the added interactivity of virtual museums' activities.

Language was also used in negotiation processes as participants co-constructed linguistic meanings by finding words and correcting each other when necessary. In fact, it was observed that, when paired with proficient students, individuals asked them how to say certain words in Italian and, once they obtained this information, they repeated the word a few times to memorise it (Extract 13; Extract 14). However, it is also true that students did not homogenously feel that the added interactivity of virtual museums fostered partners' interactions. In fact, students lamented that they did not feel proficient enough to interact with their partners in Italian or that they did not possess the vocabulary skills necessary to convey their opinions. This is likely to be the result of students not being taught art-related vocabulary prior to the activities, an obstacle to interactions which could have been overcome with targeted linguistic preparation. Consequentially, discrepancies in language proficiency are likely to be the reasons behind the close percentages between the students believing that Italian facilitated interactions and those who disagreed with this statement (Fig. 40). However, since gaps in vocabulary knowledge could be filled with targeted linguistic preparation, encouraging results arising from participants strongly believing that virtual museums facilitated group interactions suggest that these resources can be used for enhancing language acquisition and production in Italian as well as for leading to patterns of positive interdependence.

6.1.5 Virtual museums as language tools

By observing the familiarity with which students used digital tools, it can be assumed that virtual museums contributed to foster and maintain relationships of mutual reliance between participants, confirming the hypothesis that virtual museums can favour the successful establishment of bonds of interdependence between participants (Fig.36; Fig.39).

While individual attitudes, motivation and interest have played an important role in fostering students' interdependence, it can also be said that the type of technological affordances enabled by virtual tools significantly contributed to the establishment of successful mutual bonds. This underlined that the establishment of students' interdependence was subject to reliability, task feasibility and adaptability to learning situations, as men-

tioned in the studies of Bower et al. (2013) and Blin (2016). Furthermore, results confirmed findings from Lakhana (2014) and Scrivner et al., (2019) on virtual tools encouragement of participation and interactions, support of goal orientation and its attainment thanks to digital real-like activities.

Since virtual museums permitted the simultaneous view of multiple paintings, participants can focus on artwork details, refine and negotiate their choices with other individuals' contributions. It can therefore be said that the use of virtual museums confirmed the hypothesis that the added interactivity provided by platform use compensated for the missing experiential affordances of face-to-face interactions which were identified by Nadler (2020) as the main reasons behind students' online disengagement.

Furthermore, an analysis of the students' appreciation of digital activities revealed that participants enjoyed interacting with one another in virtual environments where they could use Italian as medium. However, students' responses to the questionnaire also showed that students' preferences were directed to gamified learning activities rather than group tasks. In fact, while students generally agreed that virtual museums fostered partners' interactions, they also liked to use virtuality in competition-based activities (Fig. 44; Extract 28). This demonstrated that students enjoyed to be challenged and stimulated by different learning modalities that combined interdependence-based activities with individual challenges. This suggests that, in order to avoid what was theorised by Deutsch (1949a) as negative interdependence of bungling actions aimed at reducing chances of group members' success, virtual activities need to be carefully planned to support students' mutual reliance without losing the aspects of competition and challenge provided by gamified language learning.

6.2 Limitations

6.2.3 Limited adaptability to new instructional methods and activity structure

Given that the researcher conducted the activities as a non-institutional entity, limitations to this study emerged as students' data on language skills and learning development was missing. This implied that the technological tools utilised in these activities could not be gradually introduced to the students and this caused several drawbacks including students' confusion related to being first-time users of virtual museums, adjustments to language proficiency levels that did not match students' proficiency and unease at being paired with fluent language partners (Extract 25). This was probably one of the

consequences of motivation loss, which hampered the creation of interdependent relationships between the students. Moreover, participants had to quickly adjust to unfamiliar activity and teaching styles. In fact, it was the first time that they utilised virtual museums in language activities and experienced the researcher's supervision instead of their tutors'. Consequential implications for the quality and intensity of interdependent bonds go beyond the scope of this research. However, a thorough analysis of interdependence triggered by the use of virtual museums could have considered teacher-students' relationships since both parties depended from one another for the successful task completion, as it was posited by Johnson et al. (2014). Moreover, an investigation of this topic could have led to a more accurate analysis of students' mutual reliance in achieving task goals.

6.2.4 Influence of motivation and personal interests

Distinguishing between the influence of personal motivation and the impact of virtual museums on students' interdependence was not an easy task. On the one hand, students' perceptions of the usefulness of virtual museums to foster peers' interactions, mutual dependability and personal contributions to reach activity goals were easily noticed in questionnaire answers and group interactions. On the other hand, identifying interdependence-relevant data from personal motivation, dispositions to mediate and negotiate solutions as well the presence of autonomy, self-confidence and familiarity with group members was difficult to determine since the researcher relied only on observations and transcriptions of conversations. This is why a thorough understanding of group dynamics, language proficiency levels and mutual knowledge would have been beneficial to accurately discriminate between degrees of influence of virtual museum use and motivation on students' interdependence. In fact, findings on the presence of successful students' interdependence might have led to more accurate descriptions of the degree of influence of virtual museums on interdependent relationships.

6.2.5 Lack of technological know-how

One of the main limitations of this study consisted in the participants' lack of confidence at using virtual platforms which occasionally led to confusion and motivational loss (Extract 12). This confirms the stances taken by Nadler (2020) and Greener (2020) on the importance of possessing the necessary technological know-how to be comfortable at working in digital environments and effectively engage in online activities. Overall, it is believed that a pre-activity training on the use of technological platforms would have

ensured the necessary students' familiarity to use the platforms of *ThingLink* and *Google Arts & Culture* for successful task completion and avoid potential drawbacks of first-time usage.

Additional constraints were constituted by the fact that the technological affordances of virtual museums were not fully exploited. For instance, markerless AR embedded in the *Art Projector* feature of *Google Arts & Culture* was not utilised for activity purposes due to the potential risk that AR features were not supported by students' devices. However, these affordances could have been utilised by students to project artwork in their physical spaces and provide additional interactivity to the language tasks. In other words, markerless AR could have greatly expanded the activities' potential to generate possibilities for interdependence to arise and enhance participation and curiosity.

6.2.6 Limited time availability

Time factors also constituted a limitation given that observations were conducted in short time slots, while more accurate data could have been retrieved by considering changes in group behaviours over a period of time. This would have permitted an in-depth analysis of students' intrinsic and extrinsic motivational factors, individual behaviours, interests and language proficiency. Moreover, should the activities had lasted longer with content being taught across multiple classes to test their suitability for different aspects of group interdependence, this would have enabled the collection of a greater amount of data and more accurate evaluations of students' interdependent relationships.

Different materials could have been adopted to match participants' interests and scaffolded according to their proficiency levels. In fact, as theorised by Gardner (1983) and Oxford (1997), this would have ensured efficient students' participation and inclusion across language proficiency levels, cognitive styles, types of intelligence and personalities. In this way, virtual activities could have been socially mediated to reduce potential dropouts, boredom, distractions and facilitate students' engagement. Furthermore, digital resources would have been tailored to mixed-ability classes valuing students' differences and permitting a more efficient language learning based on content retention and valorisation of participants' differences.

More time would have also permitted the integration of additional virtual platforms allowing for wider experimentations of interdependent group dynamics. For instance, the platform *Wakelet* (https://wakelet.com/) was originally planned to be used for creating virtual galleries of selected paintings from the digitalised museum collections

which would have been presented to the rest of the class. However, time constrains prevented the feasibility of this activity, resulting in limited time availability for students to give their presentations to the class.

6.2.7 Lack of homogeneity in language knowledge

Additional limitations involved language knowledge. In fact, despite the intermediate Italian proficiency of the students, it is safe to assume that discrepancies in language levels impacted the degree of interdependence established amongst the students. In particular, it was observed that students with less conversational confidence tended to refrain from interacting with others and express their opinions. This demonstrates that a pre-activity evaluation of participants' language knowledge could have contributed to establish positive interdependence amongst the students by adapting the activities to their proficiency levels. Moreover, with regards to language, it is important to highlight that technological tools did not permit language selection. Consequently, the majority of artwork descriptions were displayed according to the language settings of users' devices, which were not necessarily in Italian. Conversely, multiple language selection would have amplified students' possibilities to work with the target language to attain their task goals. Further inconsistencies were detected as sections of museums' profiles were provided in different languages. This added further complications related to not knowing in which language content would appear on students' screens.

Additional limitations consisted in a lack of investigations on the influence of linguistic aspects on students' mutual reliance. In fact, since behavioural patterns and group dynamics were the main parameters for analysing students' interdependence, examinations are missing on the role of grammar and vocabulary knowledge as well as of reading, speaking, listening and writing skills in influencing participants' interdependence.

6.3 Final discussion remarks

Overall, the results of this study have confirmed that the use of virtual museums can efficiently improve students' interdependence if situational, behavioural and technological conditions are in place. However, it has also highlighted major limitations connected to the use of technological tools, offering insights on potential new areas of investigation on students' interdependence with the use of technology for language learning purposes. In fact, the continuous evolution of virtual tools signifies that a vast supply of

digital materials can be utilised for task-based language activities and enable investigations on aspects of interdependence surfacing in different virtual learning conditions. An analysis of these aspects can have major implications for future developments in virtual language educational practices. For this reason, in order to draw conclusive remarks on this study, it is important to identify potential new directions in the use of virtual museums for language educational purposes to ensure efficient learning both fact-to-face and remotely.

CONCLUSION

Situated in the field of online language learning, this research has attempted to shed light on the creation of interdependent students' relationships in using virtual museums as materials for task-based online activities on learning Italian as FL. In the conclusive remarks of this paper, a summary of the research aims and results will be provided together with suggestions of potential areas of future investigations on the application of virtual resources for language learning purposes.

Outline of the literature

The relevance of interdependence for online language learning was highlighted in situational and behavioural benefits for group interactions. In fact, interdependence was found to maximise students' language learning potentials, favour cognitive development, foster negotiations and equal collaborations. TBLL was analysed in the literature review as an effective learning methodology for boosting students' interdependence in digital contexts and supporting learning outside of school environments, with consequential implications for the successful development of multiliteracies and the establishment of interdependent relationships. Moreover, technological affordances were reviewed as they enabled the transposition of in-person interdependence to remote virtual environments with substantial implications for the utilisation of digital tools in language learning. However, despite significant applications in the field of language education, investigations on interdependence in online language learning contexts were found to be missing, together with evaluations of task-based activities focused on the use of virtual museums.

Research overview

This analysis stem from observations on the accelerated digitalisation of language learning practices and underlined the importance of identifying solutions for maintaining students' interdependence in online learning contexts where relationships are threatened by motivational loss and exhaustion from technology overuse. To provide new directions for the development of digital language learning environments leading to successful language acquisition, virtual museums were explored in their capabilities to ensure users'

engagement and create interdependent relationships between students involved in group tasks. By hypothesising that interdependence would surface in pro-social behaviours, peer collaboration and in individuals' perceived provisions of valuable contributions to goal attainment, the research addressed the following question:

- What are the effects of virtual museums on students' positive interdependence in online classes of Italian as FL?

In an attempt to answer it, task-based language activities were planned by using virtual collections of the Doge's Palace in Venice as learning materials, which were provided by the platform *Google Arts & Culture*. The tasks were delivered to students of Italian as FL at two British universities and data was collected from observations of students' interactions as well as from quantitative and qualitative data retrieved from an online questionnaire, focus groups and tutors' interviews.

Summary of the findings

Results confirmed that the use of virtual museums fostered students' interdependence. In fact, participants displayed pro-social behaviours of negotiations and goal orientation as they identified and described virtual artwork. The subjective nature of the theme permitted students to exchange opinions using language as communication medium, collaborate to reach agreements, mediate between different points of view while preserving individuals' values in contributing to goal attainment. Despite time constraints, the activities provided insights on the educational potential of virtual museums and confirmed findings from the literature on interdependence in social and behavioural contexts. Moreover, the application of virtual museums in language learning contributed to highlight the importance of TBLL as a methodology easily adaptable to evolving applications of XR in language learning contexts.

Suggestions for future research

This research is nested in an historical period evolving from the pandemic outbreak of Covid-19 which has accelerated the digitalisation process of language education. For this reason, it is believed that future research should investigate key elements of digital language education highlighted in this research. Some of these aspects include increased interdependence resulting from the added interactivity provided by the use of virtual mu-

seum resources and students' attitudes towards the utilisation of digital applications. Further investigations could also outline new ways to ensure the adaptability of language education to the rapid evolution of digital tools in learning practices.

It is believed that investigations in the use of virtual museums for online language learning purposes could bring novelty to the research in learning Italian as FL. For this reason, it is hoped that the findings outlined in this paper may help to fill a conspicuous gap in the literature on online language education efficiently fostering interdependence as a way to overcome potential social disengagement in remote learning.

The research also highlighted the importance of training students and teachers to use digital platforms for language learning and instruction. In fact, when utilising technology in task-based language activities, it is important for teachers to possess knowledge of the available digital affordances to effectively plan language activities fostering students' interdependence, be ready to show students how to use them and answer potential questions on platforms' utilisation. In fact, given that research results have provided evidence that interactions and consequential language use increase with students' awareness of digital resources, future research would need to consider how to design effective pre-activity training methodologies on implementations of digital resource to create sustainable online learning environments supporting students' interdependence and language acquisition. On this matter, the incorporation of XR in learning environments blending in-person and remote modalities may be examined in its capability to foster the necessary mutual dependence for students' language acquisition.

Despite not being explored in this research, language proficiency factors can also be essential for determining the quality of students' interdependent relationships. In fact, for an integration of virtual resources into online language learning practices, it is necessary for students to possess adequate language knowledge in order to utilise digital materials in the target language which are not created for linguistic learning. On this matter, accurate investigations could be conducted over a long period of time and inserted within the university or school curriculum of students of Italian as FL. Additional research could be done to monitor students' acquisition of vocabulary and grammar structures related to the content of digital activities.

Investigations could also be extended to different technology types utilised in virtual museum activities. For instance, the activities could include XR-based applications of artistic and cultural content and their effects on students' interdependent relationships could be detected and measured. The use of Italian to complete these tasks would be of

particular significance due to the repository of digitalised cultural artefacts, museum collections and panoramas of UNESCO World Heritage sites which are increasingly becoming available on the websites of Italian cultural and museum institutions, especially as they often include marked and markerless AR and VR experiences accessible for free on mobile and computer devices.

All in all, this research could pave the way for future investigations on the impact of virtual resources on students' interdependence and on how these technologies can be integrated in online language learning modalities combining in-person and virtual learning. Moreover, with the increasing incorporation of digital methodologies in educational practices, investigations on online language learning practices with technology supporting students' interdependence could also have repercussions for CLIL methodologies integrating linguistic education with the online modules of schools and universities.

Conclusive remarks

It is believed that by looking at the future of language education technology will continue to radically change sensorial experiences and social interactions. Therefore, it is important to encourage individuals to consider online learning environments as opportunities to expand learning possibilities and to jointly co-construct language meanings as a way to reach mutual task goals. The use of virtual tools may help students interact in remote language learning contexts in different yet interdependently-meaningful ways. In fact, forms of interdependence resulting from online interactions will define future ways in which students and teachers will work, learn and live.

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APPENDIX A. CONSENT FORMS

The consent forms were sent at the beginning of February 2020. Tutors' forms provided instructions on how to deliver the activities since the classes had originally been planned to be conducted by the tutors. Only after these forms were sent, it was decided that the researcher would have delivered the online activities while tutors would take notes on students' interdependent behaviours.

STUDENTS - Subject information and consent form

Project title: investigating the impact of using virtual museums during Italian language classes delivered online.

Introduction

The purpose of this form is to provide you with information on the basis of which you can decide whether to participate in this study.

Any questions you may have will be answered by the researcher or by any other contact person provided below. Once you are familiar with the information on the form and have asked any questions you may have, you can decide whether or not to participate.

If you agree, please either sign this form or else provide verbal consent if you do not wish your name to be registered. Please also indicate whether or not you are willing for your contribution to be recorded.

Kindly note that recordings and data collected will not be made available to anyone other than the researcher and if necessary, the supervisors.

Please note your participation is voluntary and you may decide to leave the study at any time. You may also refuse to answer specific questions you are uncomfortable with. You may withdraw permission for your data to be used, at any time up to 5th March 2021 in which case data will be destroyed.

Purpose of the Study

You have been asked to participate in a research study investigating the impact of using virtual museums during Italian language classes delivered online.

Experiment structure

The researcher is asking for your agreement to take part to an experiment structured in three parts:

First part (at home): familiarise with *Kahoot!* and the platform *Google Arts and Culture* (instructions to be provided closer to the activity date).

Second part (online class): follow your tutor's indications on ZOOM, complete a short activity on *ThingLink* and a *Kahoot!* quiz with the rest of the class. Complete a group activity using *Google Arts & Culture*. You and your group will be assigned to a *ZOOM* breakout room.

Third part (post-class): complete an online questionnaire on the activity (which will be provided to you by your teacher). Take part to a group interview on *ZOOM* with the researcher that will last between 45 and 60 minutes. The researcher will ask you questions in English regarding your activity experience. No prior preparation is needed.

Overall, the experiment will take no longer than 2 hours to complete. You will not be asked to participate to the experiment more than one time. Please note that you will NOT be assessed for your performance during the activity and interview.

Risks

There are no foreseeable risks from participating in this study.

Compensation

You will not receive any type of payment for participating in this study.

Statement of Privacy and Confidentiality

By signing the consent document for this study, you give permission for the uses and disclosures of your personal data only for the purposes of this study.

Any publication based on the findings of this study will not contain any identifying information associated with you unless you specifically request to have your real name published in the dissertation.

Use of the data

The data will be processed to and analysed with qualitative measurements to confirm the research hypothesis. In addition to being published in the dissertation, data will potentially be included in further research collaboration with universities and schools. If you wish to know the results of the study, an electronic copy of the final dissertation can be provided to you.

Contact Information

Researcher's name: XXX. Email. Telephone number.

Alternatively, you may wish to contact my supervisors:

Dr. XXX. Email. Telephone number.
Dr. XXX. Email. Telephone number.

Department of Linguistics and Comparative Cultural Studies
Ca' Foscari University of Venice
Ca' Bembo, Dorsoduro 1075.

Confirmation and consent

I confirm that I have freely agreed to participate in the research project of (researcher's name). I have been briefed on what this involves and I agree to the use of the findings and the research methods as described above.

Participant signature:_____

Name:_____

Date:_____

The researcher agrees to keep the undertakings in this contract.

Researcher signature:

Name:

Date:

Please keep this form for future reference.

TUTOR - Subject information and consent form

Project title: investigating the effects of virtual museums activities on students' interdependence in online language classrooms.

Introduction

The purpose of this form is to provide you with information on the basis of which you can decide whether to participate in this study.

Any questions you may have will be answered by the researcher or by the other contact person provided below. Once you are familiar with the information on the form and have asked any questions you may have, you can decide whether or not to participate.

If you agree, please either sign this form or else provide verbal consent if you do not wish your name to be registered. Please also indicate whether or not you are willing for your contribution to be recorded. Kindly note that recordings and data collected will not be made available to anyone other than the researcher and if necessary, the supervisors.

Please note your participation is voluntary and you may decide to leave the study at any time. You may also refuse to answer specific questions you are uncomfortable with. You may withdraw permission for your data to be used, at any time up to 26th February 2021 in which case data will be destroyed.

Purpose of the Study

You have been asked to participate in a research study investigating students' interdependence while learning Italian using virtual museum activities in online language classrooms. The types of interdependence analysed in the study are investigated in terms of goals, tasks and outcomes.

Procedures to be followed

The researcher is asking for your agreement to take part in an experiment structured in three parts:

First part (pre-class activity): familiarise with the platforms *Thinglink, Kahoot!, Wakelet* and *Google Arts & Culture*. Read the activity instructions provided by the researcher and consult her for any questions on the activity.

Second part (online class): open the links of *ThingLink* and *Kahoot!* provided by the researcher and share your screen for Part 1 (*ThingLink*) and Part 2 (*Kahoot!*). Send students the activity link of Part 2 as well as of *Wakelet* and divide them in groups using

ZOOM breakout rooms. Please note that you MUST record the entire lesson. You will be asked to keep a diary (provided by the researcher) to note your observations on how students interact during the online activities.

Third part (post- class): participate in a short interview on the learning experience. The interview will be conducted by the researcher in Italian and will last for approximately 15 minutes. Send the researcher the recordings of the class and breakout rooms (collected from the students prior to the interview).

Overall, the experiment will take approximately 2 hours to complete. You will not be asked to participate in the experiment more than one time.

Risks

If you choose to participate in the proposed study, some risks include possible student performance anxiety that may develop from talking to and interacting with their partners in Italian. An attempt to address this possible risk is done by encouraging students' cooperation during the tasks, reminding them that the activities related to this project will not be assessed for grades.

You will also encourage your students to ask questions on how to proceed during the tasks. Inform them that all data are confidential and are stored in password-protected computers. If any reports or articles are developed from this study, confidentiality will be protected through the use of code numbers and/or pseudonyms.

Potential Benefits

Benefits include the opportunity for your students to increase cooperative relationships and peer support. They are offered the chance to get to know each other in a better way and improve their oral language skills in Italian. It is also hoped that their curiosity and interest for art, museums, Italian history and culture will increase.

We hope that, in the future, other students and teachers might benefit from the results from this study through improved understanding of cross-disciplinary virtual museum integration in the language classroom.

Compensation

You will not receive any type of payment for participating in this study.

Statement of Privacy and Confidentiality

By signing the consent document for this study, you give permission for the uses and disclosures of your personal data only for the purposes of this study.

Any publication based on the findings of this study will not contain any identifying information associated with you unless you specifically request to have your real name published in the dissertation.

Use of the data

The data will be processed to and analysed with qualitative measurements to confirm the research hypothesis. In addition to being published in the dissertation, they will potentially be included in further research collaboration with universities and schools. If you wish to know the results of the study, an electronic copy of the final dissertation can be provided to you.

Contact Information

Researcher's name: XXX. Email. Telephone number.

Alternatively, you may wish to contact my supervisors:

Dr. XXX. Email. Telephone number.
Dr. XXX. Email. Telephone number.

Department of Linguistics and Comparative Cultural Studies
Ca' Foscari University of Venice
Ca' Bembo, Dorsoduro 1075.

Confirmation and consent

I confirm that I have freely agreed to participate in the research project of (researcher's name). I have been briefed on what this involves and I agree to the use of the findings and the research methods as described above.

Participant signature:_____

Name:_____

Date:_____

The researcher agrees to keep the undertakings in this contract.

Researcher signature:

Name:

Date:

Please keep this form for future reference.

APPENDIX B. TRANSCRIPTS OF STUDENTS' INTERACTIONS.

Transcriptions have been divided by activity type with English translations provided next to verbatim transcriptions.

ID of good governor

1.

A: Oh my God, there are so many links! Quanti anni aveva in questo quadro…? Wait, what? There are the answers? No ok, I understand. We need to click on the link. Are we just guessing the answers? Because on the link there is no information about the painting. (*the researcher gives further instructions*) B: Ah, right. A: Barak Obama è l'immagine dell'uomo governo. Pietro Grimani è un italiano, Barak Obama è un uomo americano. Che dici (*says the other participants' name)*? B: (*No answer*). A: I am reading that Pietro Grimani was a poet and he knew Isaac Newton, was a diplomat. *(reads the following question out loud*) Barak Obama non è uguale. B: Barak Obama è un presidente. A: È stato un presidente. Non so. Nei tempi quando Pietro Grimani era *alive* forse era una persona ricca ma per essere un presidente oggigiorno si può essere…Non so… *(switches to English) Anyone*. Chiunque.	A: Oh my God, there are so many links! How old was he in this painting? Wait, what? There are the answers? No ok, I understand. We need to click on the link. Are we just guessing the answers? Because on the link there is no information about the painting. (*the researcher gives further instructions*) B: Ah, right. A: Barak Obama represents the man of the government. Pietro Grimani is Italian, Barak Obama is American. What would you say (*says the other participants' name)?* B: (*No answer*). A: I am reading that Pietro Grimani was a poet and he knew Isaac Newton, was a diplomat. (*reads out loud the following question*). Barak Obama is not the same. B: Barak Obama is a president. A: He was a president. I don't know. At the time when Pietro Grimani was alive maybe he was rich but in order to be president today he cannot be…I don't know… *(switches to English)* Anyone. Anybody.

2.

L: Ma dobbiamo provare ad indovinare oppure ce lo dice da qualche parte? C: Io ho trovato che ha 65 anni! L: Scusa (*states the participant's name)*, cosa ti fa pensare così? C: Perché ho trovato la sua data di nascita e quella del quadro! *(switches to English)* Shall we calculate it? L: Cosa vuole comunicare Obama con i suoi vestiti? (*reads the question out loud).* A: Sicuramente autorità, eleganza, professionalità…Magari. C: Ha…come si dice *tie*? L: Cravatta! C: Cravatta…cravatta… A: Vabbè se possiamo comparare l'istituzione classica del millesettecentocinquantadue con quella di… L: Pietro Grimani probabilmente stava nato in quella posizione ma Barak Obama doveva ottenere quella posizione…hai altri pensieri? (*refers to another participant)* A: Mah direi che comparando l'istruzione, Pietro Grimani era istruito per il suo tempo… L: Ah right. Io penso che basta così. A: Ok. Direi che qui possiamo dire che…	L: Do we have to make a guess or is it stated somewhere? C: I have found that he is 65 years old! L: Sorry (*states the participant's name)* what makes you think like that? C: Because I have found the date of his birth and the one of the painting. *(switches to English)* Shall we calculate it? L: What does Obama wants to communicate with his clothes? *(reads the question out loud)* A: For sure authority, elegance, professionality…Maybe. C: He has…how do you say tie? L: *Cravatta*. C: *Cravatta…cravatta…* A: Well, if we could compare the classical institution of the year seventeen fifty-two with the one of… L: Pietro Grimani was likely to have had family in that position, while Barak Obama had to obtain that position…do you have any further thoughts? (*refers to another participant)* A: Well, I would say that by drawing a comparison between types of education, Pietro Grimani was educated for his time. L: Ah right. I think that that's enough. A: Ok. Here, I would say that we can say that…

L: Veramente io non penso che il quadro di Obama sia serio, io penso che sia divertente. C: Nah, è molto seria! A: Beh allora direi come dice (*says the other participant's name)* che è una personalità direi liberale dai, piuttosto che conservatrice. L: Ok! Sai come si dice *progressive*? A: Progressivo. L: Ok. *(writes it down)* A: No progressivo significa un'altra cosa penso. È un false friend! L: (*says the researcher's name),* tu lo sai come si dice *progressive* in italiano? *(the researcher responds)* Grazie. A: Abbiamo finito?	L: Actually, I do not think that Obama is serious in that painting, I think he looks amused. C: Nah, he is very serious! A: Well, come on, let's say that as (*says the other participant's name)* said, his personality is quite liberal then, rather than conservative. L: Ok! Do you know how to say progressive? A: *Progressivo*. L: Ok. *(writes it down)* A: No, *progressivo* means something else, I think. It's a false friend! L: (*says the researcher's name),* do you know how to say progressive in Italian? (*the researcher responds)* Thank you. A: Are we done?

3.

I: Ottimo! *(referring to the recording in progress)* H: Se schiacci sopra il link del Doge Pietro Grimani… I: Sei tu che scrive? Siamo tutti? Ma dobbiamo fare tutti una risposta diversa? Com'è? H: Eh no, penso che possiamo dare la stessa risposta io e te. I: Va bene. Dobbiamo fare una copia del file? H: Magari sì, se vuoi modificarla ne fai una copia. I: Quanti altri la stanno modificando? Possiamo fare un file noi insieme. Faccio una	I: Great! *(referring to the recording in progress)* H: If you click on the link of Doge Pietro Grimani… I: So, does each of us need to provide a different answer? How do we proceed? H: No, I think you and I can give the same answer. I: Sounds good. Do we need to create a copy of the file? H: That would be good, if you want to modify it and create a copy of it. I: How many others are modifying it? We could create a join file. I create a copy and

copia e ti invito al mio *document*. Un secondo e mi dici la tua email. AAAH *Google Docs* encountered an error…Perfetto…	invite you to [modify] my document. One second and you can let me know your email address. AAAH *Google Docs* encountered an error…Perfect…
H: I am not surprised.	H: I am not surprised.
I: Vuoi fare tu una copia?	I: Do you want to create a copy instead?
H: Sì un attimo. *(switches to English) I got the error as well. (switches to Italian)* Forse è meglio se scarichi il documento *(switches to English) and then try to edit it in your computer*.	H: Yes, one moment. *(switches to English)* I got the error as well. *(switches to Italian)* Maybe it's better if you download the document *(switches to English)* and then try to edit it in your computer.
I: Ora posso *compartir*. Qual è la tua email? Puoi ripetere?	I: Now I can share it. What's your email address?
H: (*spells it out)*	H: (*spells it out)*
I: Dimmi se lo hai ricevuto! (*then reads the first question).*	I: Tell me if you received it (*then reads the first question).*
H: (*answers the question). (switches to English) That sounds like a lot for those days. (switches to Italian)* Ok le prime tre sono già fatte. Guardiamo la quarta? *(looks at the partners' arrow on the shared screen)* Sì, quella su cui sei adesso. Aggiungerei anche che lui fa parte dell'aristocrazia e della chiesa… *(switches to English) it's like he is a member of the aristocracy and the church. It means like…*	H: (*answers the question). (switches to English)* That sounds like a lot for those days. *(switches to Italian)* Ok the first three have already been done. Shall we look at the fourth one? *(looks at the partners' arrow on the shared screen)* Yes, the one you are on at the moment. I would add that he is a member of the aristocracy and the church… *(switches to English) (switches to English)* it's like he is a member of the aristocracy and the church. It means like…
I: Ok. Allora lui è parte, no? Come si dice…Della chiesa no? *(his partner nods his head)* Ottimo. Puoi scrivere anche tu o no?	I: Ok. So, he is part of it right? How do you say it…Of the church, right? *(his partner nods his head)* Great. Can you also write on it, right?
H: Guardiamo il quadro di Obama? Di lui possiamo dire che è un ex presidente?	H: Shall we look at the painting of Obama? Can we say of him that he is a former president?
I: Quanti anni aveva? Cinquanta e…	I: How old was he? Fifty and…

H: *(reads one of the questions Italian)* It means like… *(translates the question into English)*	H: *(reads one of the questions Italian)* It means like… *(translates the question into English)*
I: Sì ho capito.	I: Yes, I got it.
H: Pietro Grimani sembra un po' arrabbiato però diciamo che è serio e autoritario però non sembra felice.	H: Pietro Grimani looks a bit angry but we can say that he is serious and authoritative but that he does not look happy.
I: Ma non sembra anche un po' arrabbiato?	I: But doesn't he also look a bit angry?
H: Sì un po'. Scriviamo anche quello!	H: Yes, a little. We should also write this down.
I: Ma soprattutto si scrive così? *(directs the pointer to the word)*	I: But *soprattutto* is spelled in this way? *(directs the pointer to the word)*
H: Sì con la "o".	H: Yes, with an "o".
I: Quindi, un po' arrabbiato ma soprattutto autoritario. Cosa vuoi dire di Pietro Grimani?	I: So, he is a bit angry but mostly authoritative. What would you like to say about Pietro Grimani?
H: Eh, non lo so. *(switches to English) I don t know*. *(switches to Italian)* Cosa possiamo dire ancora? Fammi vedere.	H: Eh, *(switches to English)* I don't know. *(switches to Italian)* What else can we say? Let me see.
I: Secondo me non sembra molto ricco. Non sembra avere molto potere perché non vediamo tanti *joyas.* (*shows his chest as if he had been wearing big jewellery and ornaments*)	I: I don't think he looks very rich. He does not seem to have much power as we don't see many *joyas.* (*shows his chest as if he had been wearing big jewellery and ornaments*)
H: Sì, gioielli.	H: Yes, jewels.
I: Ecco, gioielli. Puoi dire quello se vuoi.	I: Jewels, there we go. You can say that if you want.
H: Però abbiamo detto che è un aristocratico e quindi in teoria dovrebbe avere soldi. Però hai ragione, non sembra molto ricco.	H: But we said that he is an aristocrat and therefore he should have money. But you are right, he doesn't look very rich.
I: Possiamo dire che è come un aristocratico ma che non è il più importante per la sua epoca.	I: We can say that he is like an aristocrat but that he is not the most important one of his times.

H: Esatto, esatto! Allora modifico quello che abbiamo scritto prima? I: Sì. Come si dice *joyas*? H: Gioielli, con la "g", come questo. (*moves the pointer to a word containing the letter "g").* I: Grazie. H: Nessun problema.	H: Exactly, exactly! (*nods his head*). Should I then modify what we have written earlier? I: Yes. How do you say *joyas*? H: *Gioielli*, with a "g", like this (*moves the pointer to a word containing the letter "g")* I: Thank you. H: No problem at all.

4.

L: *(says the researcher's name)* ci sono le risposte già nel documento? *(the researcher provides the answer)* La ricchezza…Come si dice la *royalty* in italiano? Z: Eh…Realtà. L: Reali? Che è il sostantivo…Come si dice *noun*? È sostantivo no? O è spagnolo? Z: Di che parola stai parlando? L: No, I just want the word for *noun*. Reali è un sostantivo sì, un nome… *(looks up the word online)* Regali, regalità. Z: Sì, famiglia reale o reali come hai detto. L: Mentre la di Obama è più…C'è un senso di reali ma è più accessibile. Z: Sì, ci sono più colori. Ci sono dei fiori…Fiore? L: Sì, come un uomo della gente. Z: Sì, più aperto, anche se ha le braccia incrociate. (*crosses her arms around her chest)* L: Si ma è molto casuale.	L: *(says the researcher's name)* are the answers already there on the document? *(the researcher provides the answer) La ricchezza* … How do you say royalty in Italian? Z: Eh… *Realtà*. L: *Reali*? Which is a noun…How do you say noun? It is *sostantivo* right? Or is it Spanish? Z: Which word are you talking about? L: No, I just want the word for noun. *Reali* is a noun, yes… *(looks up the word online) Regali, regalità*. Z: Yes, *famiglia reale* or *reali* as you said. L: While the one of Obama is more…There is a sense of royalty, but it is more accessible. Z: Yes, there are more colours. There are some flowers … Flower? L: Yes, like a man of the people. Z: Yes, he is more open, even if he has his arms crossed. (*crosses her arms around her chest)* L: Yes, but he is very casual.

Z: Sì, anche i suoi vestiti siano formale. L: Sì. Z: Non ha un…Come si dice *bowtie*? L: Ah sì! Non lo so. Ah aspetta… papillon. Z: Sì, dà l'aspetto di essere un po' più meno formale. Quello penso.	Z: Yes, even if his clothes are formal. L: Sì. Z: He does not have a … How do you say bowtie? L: Ah yes! I do not know. Ah wait… *papillon*. Z: Yes, he gives the impression of being a little less formal. This is what I think.

5.

R: A lato ci sono degli esempi, la tabella centrale. B: Ok cambiamo domanda. Quali differenze sociali ci sono tra i personaggi? Nel senso tra Pietro Grimani e Obama? S: Sì, oppure secondo quello che pensi che sia espresso nei quadri. J: Dipende dal potere espresso nelle due foto. Nella prima foto l'uomo è un po' più ricco. Però Barack Obama mostra un costume...Come si dice? B: È vero. Poi nel dipinto di Pietro Grimani lo sfondo è un po' scuro, mentre quello di Obama è più nell'aria aperta e questo può mostrare come il presidente è eletto mentre il doge no. Questo può essere un commentario sullo stato della democrazia. Ovviamente abbiamo parlato anche della bocca. Secondo te cosa esprimono i personaggi dei quadri? J: Il primo quadro è serio. Mi fa paura lui. È la stessa cosa di Barack Obama ma la	R: In the central table, there are some examples. B: Ok, let's change the question. What are the social differences between the characters? Does it mean between Pietro Grimani and Obama? S: Yes, or according to what you think it is expressed in the paintings. J: It depends on the type of power expressed in the two paintings. In the first picture the man is a bit richer. However, Barak Obama shows a *costume*…How do you say it? B: Yes, it is true. Also, in the painting of Pietro Grimani the background is a bit dark, while in the other Obama is in the open air and this demonstrates how the president is elected while the *doge* is not. This might reveal information on the state of democracy. We have also talked about the mouth. What do you think the characters in the paintings represent? J: The first is a serious one. He scares me. I feel the same for the one of Barak Obama

luce è più aperta, più moderna e meno seria. Tu cosa ne pensi? B: Io direi che i vestiti di Pietro Grimani esprimono più potere di quelli di Obama. Di conseguenza è lo sfondo di Obama che parla della personalità che traspare anche dalla faccia. Mentre in Pietro Grimani sono i vestiti che esprimono il ruolo della persona. Di conseguenza penso che si possano vedere tratti della personalità più nel quadro di Obama perché esprime cose diverse. È molto bello questo sfondo con i fiori. Dove si trova questo quadro *(says the researcher's name)*?	but the light is more open, more modern and less serious. What do you think? B: I would say that the clothes of Pietro Grimani express more power than the ones of Obama. Consequently, the background of the painting of Obama which talks about the personality which also emerges from his face. Conversely, in [the painting] of Pietro Grimani his clothes express the person's role. As a consequence, I think that you can see more the personality traits in the painting of Obama since it expresses different things. Where is this painting located *(says the researcher's name)*?

Google Arts & Culture

6.

A: There are a lot of people in it. It's a battle. It's cool. B: We go for the one that has people in it. A: Yeah wait, I have just found something, there is one with Emperor Constantin. It suggests some kind of democracy. B: Which one is it? A: You can cross the bottom paintings (*counts*), number seven… B: Is it the one with the two pillars over the top? A: Yeah, that's the one. The only difference is the name. It talks about electing. B: Yeah yeah. A: C'è qualcuno che… B: Rappresenta? C'è un eletto e significa… Democracy?	A: There are a lot of people in it. It's a battle. It's cool. B: We go for the one that has people in it. A: Yeah wait, I have just found something, there is one with Emperor Constantin. It suggests some kind of democracy. B: Which one is it? A: You can cross the bottom paintings (*counts*), number seven… B: Is it the one with the two pillars over the top? A: Yeah, that's the one. The only difference is the name. It talks about electing. B: Yeah yeah. A: There is someone who… B: Represents? There is an elected person and it means…Democracy?

A: Democrazia. B: Ok.	A: *Democrazia*. B: Ok.

7.

H: *(referring to returning to the breakout room with the same partner)* Eccoci *(says the partner's name)*. I: Secondo me un buon governatore non deve essere cattivo con il suo popolo. H: Esatto. I: Si perché in questa epoca, quella dei quadri tutti i governanti sembrano arrabbiati. H: Sì, cattivi. Vogliono tutti uccidere, tutti rubare. I: Sì sì. Mah…Più o meno come ora. *(giggles)* H: Esatto, però lì erano onesti. Almeno lo dicevano! *(giggles)* Stavo guardando se ce n'era uno che sembrava buono ma…non proprio. I: Guarda questo, di Giovanni Bembo, il finale (*makes a gesture to signal his partner to swipe right towards the end of the virtual gallery*). Non sembra molto buono, ma sembra savio, intelligente…non so il perché. H: 'petta eh…Come si chiama? I: Giovanni. Bembo. Da Domenico Tintoretto. H: Riesci a fare tipo share screen? Perché non riesco a trovarlo. I: Sì, è di l'ultimo. Quello…ah no no 'petta…quello (*indicates it with the pointer*). Ma anche quello…Non so.	H: *(referring to returning to the breakout room with the same partner)* Here we are *(says the partner's name).* I: I think that a good governor must not be mean with its people. H: Exactly. I: Yes, because in this era, the one of the paintings, all the governors seem angry. H: Yes, [they look] mean. They all want to kill, to steal. I: Yes, yes. Well…Like nowadays, more or less. *(giggles)* H: Exactly, but they were honest [at that time]. At least, they were admitting it! *(giggles)* I was searching weather there was one that looked kind but…not really. I: Look at this one, the one of Giovanni Bembo, the last one (*makes a gesture to signal his partner to swipe right towards the end of the virtual gallery*). He doesn't look very kind but he looks wise, intelligent. I don't know why. H: Wait uh…What's his name? I: Giovanni. Bembo. By Domenico Tintoretto. H: Could you perhaps share your screen? I can't find it. I: Yes. It is the last one. That one…ah no no wait…that one (*indicates it with the*

	pointer). But also, that one…I don't know.
H: Sì, sembra saggio. Potremmo usare quello.	H: Yes, he looks wise. We could use that one.
I: Quale preferisci? Giovanni Bembo o Girolamo Priuli?	I: Which one do you prefer? Giovanni Bembo or Girolamo Priuli?
H: Girolamo sembra più buono. Ha la faccia da persona buona.	H: Girolamo seems nicer. He has the face of a good person.
I: Sì. Come il mio nonno. *(smiles)*	I: Yes, like my grandpa. *(smiles)*
H: Esatto. Sembra un nonno! Stavo guardando se forse c'era un'immagine di un governante che aveva della gente intorno. Come per far sembrare che chiedeva aiuto anche alla sua gente. Però…No.	H: Exactly. He looks like a grandpa! I was looking weather there was an image of a governor with people around. As if to show that he asked his people for help. But…It does not look like it.
I: Ma tutti quelli che sono qua sono governanti?	I: But all those who are here are governors?
H: Penso di sì.	H: I think so.
I: Ah, ottimo.	I: Ah, great.
H: Sì, sono tutti o governanti o immagini di gente che riceve la corona.	H: Yes, they are all governors or images of people who receive a crown.
I: O importanti.	I: Or important.
H: Sì, direi che quello che hai detto prima va bene.	H: Yes, I would say that what you said earlier is good.
I: Oh! Guarda quello…Sembra un po' sul mezzo. Quello che si chiama *Venetians conquer Gallipoli*. Ah. Condivido lo schermo.	I: Oh! Look at that one… [The one] which is a bit in the middle. The one that is called *Venetians conquer Gallipoli*. Ah. I share the screen.
H: Sì grazie.	H: Yes, thank you.
I: È come sul mezzo. *(uses the pointer to indicate a painting on the shared gallery)* Qua.	I: It's like it is in the middle. *(uses the pointer to indicate a painting on the shared gallery)* Here.
H: Ah sì, bella.	H: Ah yes, good.
I: È come che il governante è con il popolo. E non vanno soli…Il popolo. Il governante va con loro.	I: It is like the governor which is with its people. They do not go alone… [I mean] the people. The governor goes with them.
H: Esatto, sì, ok. Possiamo usare questo.	H: Correct, yes. We could use this one.

I: Questo o l'altro che abbiamo detto prima? H: Questo mi piace di più. Ha più significato. I: Ottimo. E dobbiamo dire qualcosa? H: Eh, penso che diciamo solo se lui combatte insieme al popolo. I: Sì mi piace. H: Quello va bene. I: Allora torniamo? H: Sì. A tra poco.	I: This one or the one you said before? H: I like this one better. It has more meaning. I: Perfect. Do we need to say anything? H: Eh, I think we only say that he fights together with his people. I: Yes, I like it. H: That one works. I: Shall we come back [to the breakout room]? H: Yes. See you soon.

8.

L: Ma cosa dobbiamo fare? *(looks for a painting)* A: Io ne ho trovato uno abbastanza interessante…Magari condivido lo schermo. *(shares the screen)* Tipo questo qua, dove un re è solo e fa vedere le sue ricchezze. *(shows the virtual gallery and clicks on the chosen painting)* E non è la sola persona nel quadro, ne vediamo altre e questo magari significa che ascolta il popolo. *(says a participant's name)* dice che ha problemi a rientrare. L: Penso che sia spento il computer e non riesce a riaccendere. C: Qual è il quadro? L: Solo una cosa da dire: al tempo poteva essere stato un buon governante ma adesso l'idea che il potere venga dato da Dio mi sembra un po' ambiguo, no? Come idea di buon governante…	L: But what shall we do? *(looks for a painting)* A: I have found one which looks quite interesting…Maybe I can share my screen. *(shares the screen)* Like this one, where a king is alone and shows his wealth. *(shows the virtual gallery and clicks on the chosen painting)* And he is not the only person in the painting, we can see some others and this might mean that he listens to his people. *(says a participant's name)* says she has problems returning to the breakout room. L: I think her computer turned itself off and it cannot turn it on. C: What is the painting? L: Just one thing to say; at the time he might have been a good governor but now the idea that the power comes from God is a bit ambiguous, isn't it? Like the idea of a good governor…

A: *(speaks over the other participant)* non l'ha ottenuto lui il potere…	A: *(speaks over the other participant)* he wasn't the one who obtained the power…
L: Sì sì. Cosa ne pensate voi dell'uso del colore, tipo quali colori usano? Perché io tipo stavo guardando i quadri in rosso e il rosso dà un senso di potere. *(uses the "sort by colour" function on Google Arts & Culture)*	L: Yes, yes. What do you think about the use of colour, like the types of colours they use? Because I was looking at the pictures in red and red gives a sense of power. *(uses the "sort by colour" function on Google Arts & Culture)*
C: La luce è anche molto importante nei quadri. Perché la luce nei vecchi quadri riflettono… *(switches to English) A sort of God's presence.*	C: Light is also very important in the paintings. Because light in old paintings reflect… *(switches to English)* A sort of God's presence.
L: Ah ok, *(refers to one participant)* però hai visto il quadro di *(says the name of the third group member*?	L: Ah ok. *(refers to one participant)* but did you see the painting chosen by *(says the name of the third group member)*?
C: Sì in questo quadro è molto importante la luce…	C: Yes, in this painting light is very important…
L: Cosa ne pensa se la mando in chat adesso? Oppure un'immagine più contemporanea tipo per un buon governante? Tipo, un po' più militario, una dove i livelli delle persone fa sembrare che abbia più potere perché lui è in alto.	L: What do you think if I send it [the link to the painting] in the chat? Or maybe a more contemporary image of a good governor? For instance, a more soldierly type, a painting where the people involved demonstrate that he has a higher ranking.
A: Mah, a me piace un sacco anche questo qua perché fa vedere i doni che riceve dal popolo.	A: I also like this one because it shows the gifts that he received from the people.
L: Ah ok ma allora tu pensi che anche nell'altro lui dona i doni dalla gente o no?	L: Ah ok, but then you also think that also in the other where he gives gifts to people, right?
A: No, non lo fa pensare proprio, non lo fa vedere…non mostra che lui dà alla gente, né che lo riceve.	A: No, it does not make [viewers] think like that at all…it [the painting] doesn't show at all that he gives them [the gifts] to the people, nor that he receives any.
L: Ah ok, ma rimane sempre la mia preferita. Te *(says the participants' name)* hai dei pensieri o no?	L: Ah ok, but that [the painting] still remains my favourite. You *(says the participants' name),* do you have any thoughts on it?

C: Penso che i quadri siano… *(switches to English) I am just trying to find all the links that I have lost.*	C: I think the paintings are… *(switches to English)* I am just trying to find all the links that I have lost.

9.

Z: Stai condividendo lo schermo? L: Si ma non capisco cosa fare. *(the research repeats the instructions)* L: Lo vedete adesso? *(shares her screen)* Ma stavo vedendo questo quadro *(drags the pointer on the painting and clicks on it)* e cercando di leggere le parole con questo…Cos'è questo? *(indicates with the pointer one detail of the painting)* S: Una pergamena. L: Cos'è una pergamena? S: *It's a parchment*. L: Ah sì. Ma è più come latina… S: Sì si è latino. L: Questo personaggio è molto intelligente. Forse è una persona che si può confidere. S: Di cui ci si può fidare. Una persona fidata. L: Ma possiamo cercare un altro? Z: Forse si quello lì sembra un uomo ricco perché è molto grasso ed è un simbolo di ricchezza. S: *(laughs)* Ah, e per questo sarebbe un buon governante? Z: Eh, la ricchezza vuole anche dire educazione quindi che sarebbe meglio governare il paese di una persona qualunque…Come si dice *anyone*? S: Di chiunque altro.	Z: Are you sharing the screen? L: Yes, but I do not understand what to do. *(the researcher repeats the instructions)* L: Ok. Do you see it now? *(shares her screen)* I was looking at this painting *(drags the pointer on the painting and clicks on it)* and trying to read the words on this…What's this? *(indicates with the pointer one detail of the painting)* S: It's a *pergamena*. L: What's a *pergamena*? S: (*switches to English)* It's a parchment. L: Ah yes. It's like Latin. S: Yes, yes, it's Latin. L: This character is very clever. Maybe it is a person we can trust. S: Who you can trust. A trustworthy person. L: But we can also look for another one? Z: Maybe that one is a rich person because he is very fat and is a symbol of wealth. S: *(laughs)* Ah, and does that make him a good governor? Z: Eh, wealth also implies education and therefore this person would be better at governing a country rather than any other person…How do you say anyone? S: *Di chiunque altro*.

Z: Anche il colore è di oro…Si dice oro?	Z: Also, the golden colour…Do you say it like this, *oro*?
S: Sì, dorato.	S: Yes, *dorato.*
Z: Sì. È anche un simbolo di ricchezza e anche perché non so, sembra anche molto savio. Perché è vecchio e vuol dire che ha visto molto.	Z: Yes. It's a symbol of wealth also because I don't know, he also seems very wise. Because he is old, that means he has seen a lot.
S: È un buon governante perché è grasso, vecchio ed istruito. *(everybody laughs)*	S: He is a good governor because he is fat, old and educated. *(everybody laughs)*
Z: Eh ma questa è una conseguenza delle cose buone che ha fatto. E anche sembra che ha un bel stilo di capelli sulla faccia…Cioè non sembrano un casino.	Z: Eh, but that's a consequence of the good things he has done. It also seems that he has a good hair style…Well, they do not look like a mess.
S: Ho capito.	S: Yes, I understand.
Z: Sì è ben tagliato.	Z: He is well groomed.
S: Ok, well groomed. *(everybody laughs)* Si presenta bene.	S: Ok, well groomed. *(everybody laughs)* He presents himself well.
L: *(zooms on the face of one of the characters and laughs, together with the others).*	L: *(zooms on the face of one of the characters and laughs, together with the others).*
S: E allora quale scegliamo, questo o l'altro?	S: So, which one do we go for? This one or the other?
L: Questo.	L: This one.
S: È troppo simpatico ormai. È serio, grasso, saggio, ricco… *(everybody laughs)*	S: He is too nice. He is serious, fat, wise, rich… *(everybody laughs)*
Z: Sembra Babbo Natale.	Z: He looks like Santa Clause.
S. Sì. È rassicurante, affidabile… E come Babbo Natale può fare doni agli altri.	S: Yes. He is reassuring, trustworthy…And like Santa Clause he gives gifts to others.
Z: Sì. È generoso.	Z: Yes. He is generous.
S: Allora scegliamo questo?	S: Shall we go for this one then?
L: Andiamo… *(switches to English) As well*? Lo metto nella chat.	L: Let's go… *(switches to English)* As well? *(switches back to Italian)* I put it [the link] in the chat.

10.

B: Sta registrando per te?	B: Is it recording for you?
J: In questa immagine che abbiamo scelto si può parlare di mani del governo che ci salva dai problemi come la pandemia. Hai altre idee *(says the name of the other participant)*?	J: In the image we have chosen we can see the hands of the government which saves us from problems such as the current pandemic. Do you have other ideas *(says the name of the other participant)*?
J: Mi piace questo quadro ma è un po' difficile da spiegare perché c'è in mezzo il buio quindi non so cosa può rappresentare, ma mi piace l'idea della barca. La barca potrebbe rappresentare una nazione, non so.	J: I like this painting but it is a bit difficult to explain because there is darkness in the middle and therefore, I do not know what it might represent, but I like the idea of the boat. The boat might represent a nation, I don't know.
B: Anche si può pensare forse che con questo simbolo, con questa metafora, che il governo al momento sta mettendo i soldi, non so come dirlo in italiano, like… *(switches to English*) The vessels that hold our nation together like the NHS and the furlough scheme... *(switches back to Italian)* Non sto dicendo che questo governo rappresenta un governo perfetto, al contrario, ma quest'idea della popolazione come il nostro sistema sanitario, forse questo quadro è abbastanza pertinente…Non so. Che ne pensi di questa parte in rosso?	B: Although we might think that perhaps with this symbol, with this metaphor, the government at the moment is keeping money aside, I don't know how to say this in Italian, like… *(switches to English)* The vessels that hold our nation together like the NHS and the furlough scheme… *(switches back to Italian)* I am not saying that this government represents a perfect government, on the contrary, but this idea that the population like our public health system, maybe this painting is related to this…I don't know. What do you think about that part in red?
J: Ma cos'è, una parte della parte? Cioè, come dicevi te è un po'…	J: What is it? A part of a part? Well, like you said, it's a bit…
B: Un casino. *(laughs)*	B: It's a mess. *(laughs)*
J: Sì è un po' disordinato. Dietro di lei…	J: Yes, he is a bit messy. Behind her…
B: Non so se…Penso che sia una donna.	B: I don't know if…I think she is a woman.

J: Sì ma è un po' difficile da vedere le cose perché è un po' disordinata.	J: Yes, but it's a bit difficult to see things because she looks a bit messy.
B: Non so come dirlo…*The anchor*? *(switches to English) Let me see… (switches back to Italian)* Ancora, catenaccio? È scritto allo stesso di ancòra… Si ma questa idea che un buon governo è un peso che mantiene un paese stabile sì…	B: I don't know how to say it…The anchor? *(switches to English)* Let me see. *(switches back to Italian) Àncora, catenaccio*. It's written in the same way of again. Yes, but this idea that a good government is a heavy weight that keeps the country stable, yes…
J: Ma io non so dove sono le robe nel quadro.	J: But I don't know where things are in the painting.
B: Neanche io, è un po' scuro.	B: Me neither. It is a bit dark.
J: Si ma è il tempo… *(switches to English)* Like weather, do you say it like this?	J: Yes…The weather. (*switches to English)* It is like in French, *la méteo*. The sky.
B: Si il meteo. È come in francese, le meteo. Il cielo.	B: Yes, *il meteo.* It's like *la méteo* in French.
J: Si è un po' come dire…Cosa possiamo dire di questo cielo?	J: Yes, it's a little bit like saying…What can we say about this sky?
B: Nuvolosa. Si può vedere il cielo.	B: It's cloudy. You can see the sky.
J: Ma questa donna cos'ha?	J: But what does this woman have?
B: Un vestito. È rosso e bianco. Ha colori forti. Si. Non ho altro da aggiungere. Il bianco è il colore di *purity*…Purezza, incontaminazione. Ma questo è importante collegamento con il Coronavirus con un governo che propone quest' idea di evitare della popolazione. Ma il rosso è un colore piuttosto regale.	B: A dress. It's red and white. It has strong colours. Yes. I have nothing more to say. White is the colour of purity…*Purezza, incontaminazione*. But this is an important connection with Coronavirus since this government which puts forward the idea of avoiding people [to meet]. But red is quite a regal colour.
J: Forse la faccia? Possiamo parlare della faccia?	J: Maybe the face? We can talk about the face?
B: Sì. C'è tanto chiaro, c'è più luce sulla faccia mentre lo sfondo è scuro. È qualcuno di molto aperto, si può vedere la faccia. Non c'è niente di nascosto che questa idea è importante per un governo…mi viene in inglese… *(switches to English)*	B: Yes. There are a lot of clear colours, there is light on his face while the background is dark. He must be someone quite open, you can read it in his face. There is nothing hidden in this idea that it is important for a government… *(switches to*

like transparent? *(switches to Italian)* Trasparente. J: E lei sembra anche molto forte. B: È vero. I piedi nudi forse rappresentano come questa persona fa parte del popolo ed è anche una persona normale che ci rappresenta, per noi questa democrazia è importante, questa idea di essere una di noi.	*English)* Like transparent? *(switches to Italian) Trasparente*. J: And she also looks really strong. B: That is true. Bare feet probably represent how this person belongs to the people and it is also a normal person who represents us, for us this democracy is important, this idea of being one of us.

11.

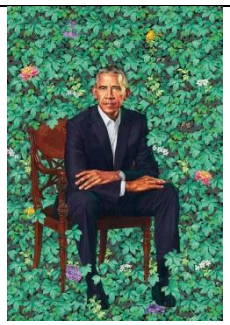
C: Which one do you like? M: Ok let me just open it…how do I open it? Do you guys know how to open it? Where do I click? C: Go down to the one hundred and thirty-seven objects and just click right on the arrow. M: I am sorry I am bad with it…ok now I've got it. C: I would like to pick a woman but there seems to be no woman in the collection. We could just pretend, pick one and say it's a woman. M: Ahah I have found it! He looks like he is wearing a mask… C: Yes, but that does not make it a good ruler, right? E: Or we could say something like... C: Yeah, that would be good. M: Ok which one? C: *(names the painting)* might be good? Like it's on diplomacy? E: Yeah, we like diplomacy. M: Where is that one?	C: Which one do you like? M: Ok let me just open it…how do I open it? Do you guys know how to open it? Where do I click? C: Go down to the one hundred and thirty-seven objects and just click right on the arrow. M: I am sorry I am bad with it…ok now I've got it. C: I would like to pick a woman but there seems to be no woman in the collection. We could just pretend, pick one and say it's a woman. M: Ahah I have found it! He looks like he is wearing a mask… C: Yes, but that does not make it a good ruler, right? E: Or we could say something like... C: Yeah, that would be good. M: Ok which one? C: *(names the painting)* might be good? Like it's on diplomacy? E: Yeah, we like diplomacy. M: Where is that one?

C: Where is that one? You need to send links! E: Ok I have just sent it in the chat. C: Should we take that one? Let's do it. M: Who is going to do the presentation? I can't do it today. I had a whole morning with doctors… *(says the name of one of the participants)* Would you do take over please? C: What's meeting again? If you want to say he is good ruler we should maybe say that he is not receiving gifts. M: So, what is he doing? *(switches to Italian)* Lui riceva gli ambassadori? I ambassodori? C: How do we say Persian? E: Persiani! C: There we go! E: If we say la diplomazia di, what would the word for advice be? C: I don't know let's look it up! M: But it's a weird painting. I am just realising he is sitting right there surrounded by guys looking like Turks. C: Yeah, but perhaps it's like painters who painted lion without having never seen one! M: Did you find the word for advisors? C: Consulente…No, probably consigliere sounds better. E: I just wrote amici. *(giggles)* M: Molti consiglieri differenti…I consiglieri sono di culture…I culture? C: Le culture differenti.	C: Where is that one? You need to send links! E: Ok I have just sent it in the chat. C: Should we take that one? Let's do it. M: Who is going to do the presentation? I can't do it today. I had a whole morning with doctors… *(says the name of one of the participants)* Would you do take over please? C: What's meeting again? If you want to say he is good ruler we should maybe say that he is not receiving gifts. M: So, what is he doing? *(switches to Italian)* He receives the ambassadors? *I ambassadori*? C: How do we say Persian? E: *Persiani*! C: There we go! E: If we say the diplomacy of, what would the word for advice be? C: I don't know let's look it up! M: But it's a weird painting. I am just realising he is sitting right there surrounded by guys looking like Turks. C: Yeah, but perhaps it's like painters who painted lion without having never seen one! M: Did you find the word for advisors? C: *Consulente*…No, probably *consigliere* sounds better. E: I just wrote amici *(giggles)* M: *(switches to Italian)* Many different councillors…The councillors are of cultures…*I culture*? C: The different types of cultures.

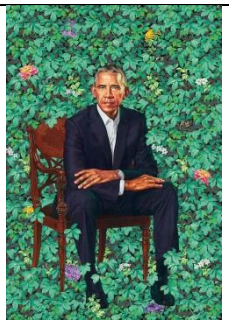
M: Ok so…questo quadro è un piccolo simbolismo, noi abbiamo due cani che significano (*switches to English*) *fidelity and trustworthiness.*	M: Ok so…this painting is a small symbolism; we have two dogs meaning (*switches to English*) fidelity and trustworthiness.
E: I cani sono…	E: The dogs are…
C: (*speaks over hi*m) I cani rappresentano *(switches to English) loyalty*. *Trustworthy* is affidabile. *(switches to Italian)* Rappresenta quindi il doge e l'affidabilità, per esempio?	C: (*speaks over hi*m) The dogs represent *(switches to English)* loyalty. Trustworthy is *affidabile*. *(switches to Italian)* Therefore, it represents the *doge* and trustworthiness for instance?
M: Com'è *loyalty*?	M: How do you say loyalty?
C: Onesto.	C: *Onesto*.
M: *(says one of the participants' names) are* you writing everything down for the presentation?	M: *(says one of the participants' names)* are you writing everything down for the presentation?
E: Yes, most of it! Anything else? Maybe the beard is a sign of wisdom?	E: Yes, most of it! Anything else? Maybe the beard is a sign of wisdom?
M: *(continues to dictate words and ignores his intervention)*	M: *(continues to dictate words and ignores his intervention)*
C: Il doge è al centro…	C: The *doge* is in the centre…
M: No, he is not in the centre, that's why we could add on to that and explain the context.	M: No, he is not in the centre, that's why we could add on to that and explain the context.
C: Ok, how do we say that?	C: Ok, how do we say that?
E: Il doge non è al centro. Tutti i personaggi sono importanti.	E: The *doge* is not in the centre [of the painting]. All characters are important.
M: Ci perché…Tutti i personaggi sono importante come il doge.	M: Yes, because…All participants are important as the doge.
C: But if you look at the other picture, I have just sent to you in the chat you see that the doge is very much in the centre.	C: But if you look at the other picture, I have just sent to you in the chat you see that the doge is very much in the centre.
M: Quindi dimostra di…Il doge rappresenta qualcosa di importante.	M: So, it demonstrates that…The *doge* represents something important.

APPENDIX C. RESULTS FROM THE 1ST PART OF THE TASK CYCLE

The results that follow are taken from the only two Word documents which were returned to the researcher at the end of the activities. The students who completed the exercises possessed an intermediate level of proficiency. Verbatim content has been transcribed.

Come viene rappresentato il "buon governante" in questi quadri? *Confrontateli e rispondete alle domande.*		
	 **Doge Pietro Grimani** **Data: 1752** **Artista: Francesco Fontebasso** **Luogo: Palazzo Ducale di Venezia** **https://artsandculture.google.com/asset/portrait-of-doge-pietro-grimani/KgF7aEFqhl0HOw**	 **Barak Obama** **Data: 2018.** **Artista: Kehinde Wiley.** **Luogo: Smithsonian's National Portrait Gallery, Washington D.C.** **https://artsandculture.google.com/asset/president-barack-obama-kehinde-wiley/kgGqONkp0JVsCA**
Quanti anni aveva il personaggio in questo quadro?	75	57
Che cosa vuole comunicare il personaggio con i suoi vestiti? ***(per esempio: ricchezza, benessere, conservatorismo…)***	Ricchezza, autorità	Autorità, professionalità, semplicità
Quali differenze sociali ci sono tra i personaggi? ***(per esempio: appartenenza alla classe***	Nato nell'aristocrazia Meno istruito	Ottenuto il potere Più istruito

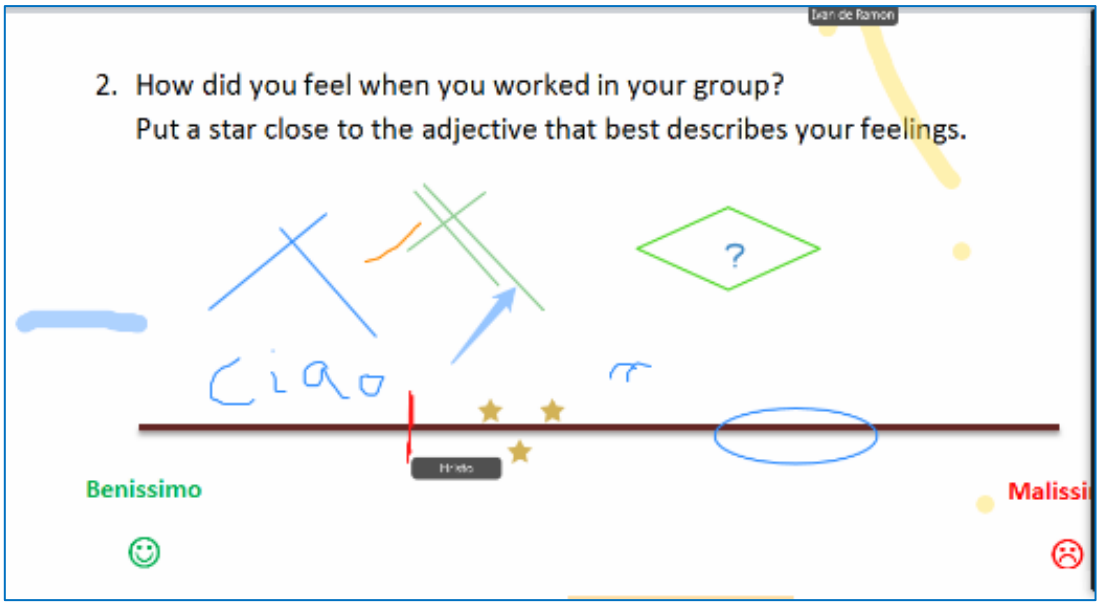
aristocratica, livello di istruzione…)		
Quale personalità esprimono i personaggi in questi quadri? ***(per esempio: autoritaria, seria, conservatrice…)***	Conservatrice, autoritaria, seria	Autoritaria, liberale, moderna, progressista

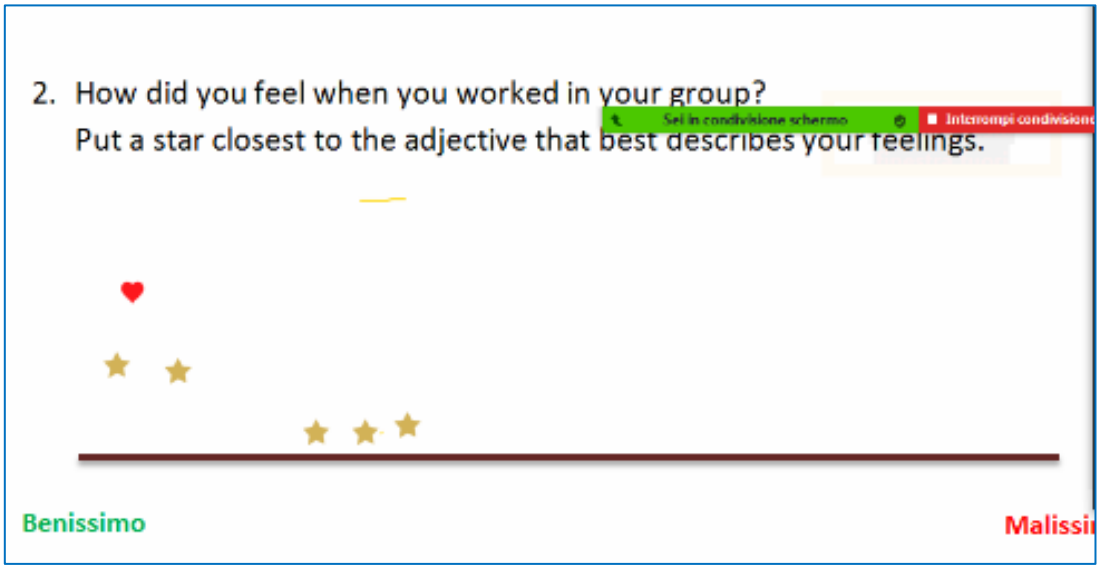
Come viene rappresentato il "<u>buon governante</u>" in questi quadri? *Confrontateli e rispondete alle domande.*		
	 **Doge Pietro Grimani** **Data: 1752** **Artista: Francesco Fontebasso** **Luogo: Palazzo Ducale di Venezia** **https://artsandculture.google.com/asset/portrait-of-doge-pietro-grimani/KgF7aEFqhl0HOw**	 **Barak Obama** **Data: 2018.** **Artista: Kehinde Wiley.** **Luogo: Smithsonian's National Portrait Gallery, Washington D.C.** **https://artsandculture.google.com/asset/president-barack-obama-kehinde-wiley/kgGqONkp0JVsCA**
Quanti anni aveva il personaggio in questo quadro?	75	57
Che cosa vuole comunicare il personaggio con i suoi vestiti? ***(per esempio: ricchezza, benessere, conservatorismo…)***	Stato sociale, borghesia, ricchezza e potere. sembra che sia un personaggio storico ricco perché indossa un casco per mostrare le sue victore in battaglia.	Benessere, potere, istruzione Moderno.
Quali differenze sociali ci sono tra i personaggi? ***(per esempio: appartenenza alla classe aristocratica, livello di istruzione…)***	Differenza in epoca C'è una grande differenza in ricchezza a causa della differenza in epoca. Pietro Grimani è un aristocratico ma non sembra essere un personaggio di molta	Istruzione più elevata Obama è stato presidente degli Stati Unit.i

	importanza, non da l'impressione di essere particolarmente ricco Lui è parte della chiesa	
Quale personalità esprimono i personaggi in questi quadri? ***(per esempio: autoritaria, seria, conservatrice…)***	Lui sembra un po arrabbiato ma soprattutto autoritario. Come non vediamo molte gioielli non sembra da essere il aristocratico più rico è possibilmente	

APPENDIX D. SCREENSHOTS OF POST-TASK RESULTS

ZOOM screenshots with post-task activities conducted with some of the participants from the University of Manchester and all the participating students from King's College London.





2. How did you feel when you worked in your group?
Put a star closest to the adjective that best describes your

Benissimo Malissi

3. How confident did you feel at using technology during the activity?
Put a star under the adjective that best describes your feelings.

Moltissimo ☺ ☺	Molto ☺	Poco ☹	Pochissimo ☹ ☹

APPENDIX E. TRANSCRIPTS OF TUTORS' INTERVIEWS

TRANSCRIPT – TUTOR A

- **In your opinion, what are the most relevant aspects that you identified in group interactions during this virtual activity?**

I would not have expected such a gap in terms of interactions across the different groups. Students who were in their last year of study spontaneously interact. There was no need to give them prompts to stimulate conversations. Maybe it is due to the fact that they wanted to participate in this activity. These students had complained about the fact that they did not spend as much time in Italy as exchange students due to the pandemic outbreak but they were very interested in this activity's topic and involved in conversations. I have seen levels of interest and interactions that I do not normally see in my classes. Students had been preoccupied about not being enough prepared to talk about complex topics. But with this activity, everything changed. They were completely gripped and talked freely.

I have seen the same gap with the other two groups. Second-year students were immersed in searching for answers without interacting. One student in particular was very concentrated on doing things on his own. He was clearly researching the paintings online but did not share the content of his work. He was in his own dimension. However, he was paired with someone who did not talk and kept her video off. So naturally it was not spontaneous for him to interact with her. Maybe the whole group was not motivated to do the activity, but I rarely see them motivated in my classes too.

I noticed that the first question on finding the age of the *doge* and Obama was generally not well understood. People were trying to find the answers online. They were confused because they could not find ages stated on *Google Arts & Culture*.

Second-year students surprised me. One of the students was born and bred in Italy. Yet she did not interact. She did not know what to say and kept her video off, which did not facilitate interactions. She is an economist and perhaps she did not have interests in the topic. But this is something I noticed in my classes as well. She comfortable at talking about herself, but not on other topics.

In the other group there was a girl who is quite shy. She normally says things only when she has to say them, she is scared of making mistakes and it is difficult to make her

interact. She was paired with a student who has no difficulty in expressing himself and this pairing did not facilitate interactions amongst them.

Shy individuals were speaking only when I encouraged them to. Only when I said something like "what kind of adjectives would you use to describe the background of the painting?" she would respond. It is not that she did not know the language to express their opinions. It is just that opinions would not spontaneously arise from her.

Surely my presence was less important for the last year students. Their interactions were less affected from my presence. They were not scared. I have just had a feeling that my presence in the rooms of the second-year groups were compromising conversations. The fact that I was there forced the students who were not talking much to say something. This did not happen with last year students. I entered the rooms in the middle of their conversations and they just kept talking. In fact, they included me in what they were doing. They asked for my opinions, for meanings. I became part of their conversations.

The students were asking me clarifications on meaning. They believed that I would have helped them in doing the activity.

- **Did you notice changes in terms of levels of interactivity and language production during these activities from the usual classes you have with the students?**

They were perfectly comfortable with using technology. After a year of using *ZOOM* to attend classes online and doing group work, they knew how to use it well. As a consequence, it was easy for them to quickly learn how to use the other applications included in the activities.

I don't know if overall remote learning has favoured interactions amongst students. I think it made discrepancies in language proficiency levels arise more prominently. Less proficient students were annoyed by fluent individuals and preferred to use English instead of Italian. It all comes down to the kind of people who belong to the groups. If they feel comfortable and that perceive that difference in proficiency are not significant, language skills significantly improve. I am now happy that in my classes Italian is used as the main language of interactions rather than English.

English students generally want to avoid to make others feel uncomfortable. They want to avoid to show off their language skills if they can, for the benefit of group relations. They don't like when someone says a word in Italian and then immediately provides the translation.

- **Are there any further observations that you would like to add?**

The good thing about distance teaching is that I have the material ready to use. I can save time. But for students, there is a huge loss. They miss the fundamental element of sociality. Consequently, they get distracted more easily and losing their minds. Personally, I miss a lot having an overall sense of how the group is working. If I am in class, in face-to-face interactions, I may interact with one group but always be vigilant about what the others are saying.

I think it has been good for them to do something new, which is definitely something this activity provided. Nowadays the university system in the UK is very exam-oriented. Structures of materials and classes repeat themselves as they prepare students for very specific skills. Doing something different is like a breath of fresh air to them.

TRANSCRIPT – TUTOR B

- **In your opinion, what are the most relevant aspects that you identified in group interactions during this virtual activity?**

In the breakout room I observed, one of the students was initially very involved but then suddenly stopped speaking and interacting. On the other hand, the others spoke Italian or a mix of Italian and English and never stopped speaking. In general, I saw people who were very proactive. Even the ones you would less assume they were.

Surely, they perceived my presence in the room as an invasion of their 'private space' to talk.

Turn-taking was respected. It was interesting to see how a student who is not usually loquacious spoke a lot during the session whilst normally it is definitely not her who initiates a conversation during activities. You could clearly see that she was using Italian much more than usual. She did not stop talking even when making mistakes.

It was good that you [the researcher] sent me the materials and the grid before the activity, so that I could check the platforms you used and the parameters you were interested in. I prepared them in previous lessons by teaching the lexicon I foresaw they could have used during this activity. Surely students have transferred this knowledge whilst doing your activity.

I believe that it is quite natural that students assign roles to each other when doing group work. It is in the nature of breakout rooms; students are given a task to complete,

and they have to report it to the rest of the class once the activity is over. It is a way to organise their group work.

Lexicon is not acquired at the same speed of grammar, so it is good to challenge students with tasks which are more advanced than their actual level of language proficiency.

It is good that they knew why they were doing the activity. It kept them motivated.

- **Are there any further observations that you would like to add?**

I thought the activities were well structured. Students appeared to move across tabs with ease and the fact that they knew each other well surely helped them navigate through the virtual galleries because they were assisting those who struggled with technology.

The brainstorming activity was too easy. Students were not challenged enough. It would have been better to involve students in a more engaging activity with a word map they could complete together. The idea behind your activity was good. It is just that the images provided were not quite similar to the painting of Canaletto. Students are quite educated and they already knew something about Venice. Perhaps it would have been better if you had shown them something more unusual, like the recreation of Venice in Las Vegas, and make them compare a picture of it with Canaletto's painting.

Gamification is risky with adults. They might fail to understand the purpose behind an activity turned into a game. Yours [with Kahoot!] was well structured but it could have been kept as an interlude between sections rather than one of the main activities.

The activity on *Kahoot!* was very well designed, but in general it is a tricky tool. For us teachers, it does not matter who wins or loses the game, but for students it might see it differently. We (as teachers) need to walk into their shoes and understand their point of view when preparing games. Otherwise, we run into the risk of demotivating students.

The idea of making students choose a painting on a given theme was absolutely great. It gave them purpose. Also, it is good that they had to look for the painting that best represented the "good governor". They could draw a comparison with the contemporary world.

I find that students did not talk very much about whether they liked the paintings or not. They focused more on describing the painting to one another. They were trying to understand who were the people represented in the painting. They did not discuss about style very much. Probably because they did not have the language skills to talk about it.

Regarding the kind of language used during the class, one student repeatedly used English. Conversely, while the others sometimes replied to her in English, they used Italian when describing the painting. Overall, there was a good balance in the use of the two languages.

It would have been better if the students were divided in pairs, rather than in groups of three or four. They would have worked better in pairs, or at least perceived to do so.

FOCUS GROUP A

Since the interview was conducted in English, verbatim transcriptions are provided.

- **How are you coping with the current situation of online learning?**

A: I am actually doing all right. Our university has done a good job at adapting to online teaching.

L: I am liking online classes. I was normally 15 minutes late when we were attending classes in person, now only two-three minutes.

- **Did you like this activity?**

C: I thought it was very interesting to learn more about Venetian art and history and the way it [*Google Arts & Culture*] is made with *Street View* was very interesting. It felt like we were there. I felt that I was in that museum visiting even if it is not possible now. I thought it was really cool the way it was made. And I was interacting with my peers which was really good.

L: Yeah, I really liked it. I think that the visuals made it much easier to interact with everyone and talk to anyone.

A: I agree and I imagine that if we were shy, we could get creative and we didn't have to think about using a foreign language.

L: I think it is not always a matter of being shy. Art is quite a light topic. Say for instance we were talking about abortion or something like that, I could just turn around and say: "I did not agree with you". So, I felt that this topic was quite nice, it is much easier to talk about art.

- **What are you missing the most about in person classes? Which similarities and differences can you identify?**

A: I don't find much of a difference, maybe the only difference is the person-to-person contact.

L: I don't find too much of a difference either.

C: I don't see much difference with the language modules. But with other modules is radically different. They don't give us as much effort as language classes. So, especially

with Italian, tutors are doing a really good job with *ZOOM* and interactive learning is very good and very well made.

L: I like *ZOOM* because *(says the tutor's name)* puts us in groups and make us interact.

C: It's not too bad for us because we already know each other, whereas for first years or for someone who doesn't know anyone in the class it might be different and would have a different point of view than us. It is obviously easier for us to be in breakout rooms.

A: In French seminars I don't know many people and I don't like interacting much with that group of people because I have never met them in person. If I had the chance to meet them at least once a week, that would have been enough to do some language practice in the breakout rooms.

- **What about the video? Do you normally keep it on or off?**

C: It depends by the type of class. With language classes the groups are smaller and the videos help us interact and make everyone comfortable because we can see each other. But with business lessons for examples, where there are 150 people, there is just no point of turning the camera on.

L: I turn it on when they ask me to.

A: Yeah same, I turn the video on when they ask me to or doing seminars, mostly. If they never ask us to turn the video on, I don't do that.

- **Can you describe a moment when you felt you were leading your group?**

A: At the beginning when we still discussing the painting to choose, maybe I got the idea whilst we were still deciding what to do.

L: Yeah, but yours were good ideas. Also, it was very easy to interact and everyone gave its own input.

C: Me as well, except that I had technical difficulties and I missed a chunk of the choosing part. But when I turned back in, I thought the painting choice was very good and that people could give their opinions.

- **Do you feel that technology prevented you from interacting with your group members?**

C: It is very difficult if the computer doesn't work. But it can be overcome.

L: It was better using the computers at the library, they never had problems.

A: Never had these problems.

- **Did you feel that the contributions you made to the activities were useless?**

C: I felt like that when my computer broke, my level of Italian was not good enough. When *(says the name of a group member)* talks too fast I am a bit lost but then I can catch up and it is fine.

L: I think we forgot that we were learning Italian, so no really, it was very easy to interact.

A: When you get creative, you don't think about the language so, no uselessness felt at all.

- **Did you feel equal to your peers during the conversations?**

L: It's much easier to interact with a person with a good level of the language and feel equal with him or her.

- **What kind of person do you like to interact with the most in online class?**

C: I prefer being with a someone with a good level of Italian and good knowledge of Italian. It is frustrating being with someone who does not want to be there and does not want to interact. It happens to me with another class and it is very frustrating. It is good to be with someone who is actually interested in the subject and in what we are doing.

A: I agree. Some breakout rooms are just painful for that! In my situation I don't think about language too much, so people ask me questions and it is nice that way.

L: As long as everyone is interested and the level of conceptualisation is high, it is good.

FOCUS GROUP B

Since the interview was originally conducted in Italian, transcriptions have been translated into English.

- **Did you find these activities interactive?**

L: For me yes, a lot. I have never met the people in my Spanish class and the teacher doesn't make us interact while *(says the Italian tutor's name)* makes the effort to make us do that.

- **What are the challenges of remote language learning?**

B: I think that it is difficult to keep ourselves concentrated in such situation of distancing.

I: I think the problem is not so much about the medium or about having classes online. It is more about the motivation that we have now. We have the materials, class content is interesting but it is difficult to keep the motivation, to attend lectures.

- **What are the strategies that you are adopting to keep you motivated through the day?**

H: I think it's hard to keep ourselves motivated but I try to keep it as part of my routine, I wake up in the morning, I have breakfast and then I study.

B: We try to get out every day to avoid staying in front of the screen all day because after a while you are tired of sitting down, it's important to move.

- **How are keeping in touch with your friends and families?**

I: It is a difficult moment for social relationships because all we can see online are happy friends but I don't think it is the case, but what we see on our phone is this: people who want to present themselves as happy individuals. I think it's contradictory. This is not healthy for our minds.

L: I find that when a friend asks me how are you, that is not true, it is not always the truth but it is easier to say we are ok because the whole world is suffering at the moment, I feel that my problems are not the worst.

- **What are you missing the most about in-person classes?**

Z: I like the activity, it was an interactive way of seeing museum content, but it is not the same as seeing it in person. But we cannot do that at the moment but it is nice to see museums in this way.

J. I liked it because it is a way to travel online.

- **Think about when you were interacting during the activity in groups. What are the similarities and the differences that you can find between in-person and remote language classes?**

H: I have started university entirely online. I have never seen the campus so I did not have the chance to meet people. If you start university remotely, you never know what the others are doing, you cannot compare your work with anyone else's, you are all alone.

I: We have not done much group work at university because like in physics we are 150 people so it's impossible to do group work but I have seen that on *ZOOM* we do breakout room and depending on how it is done, I think it is a good thing. In big groups, nobody turns the camera on, but if we are in groups and we are friends, we work well. We can talk and get to know each other well.

J: I think it is difficult to work together in groups on *ZOOM*. For instance, I need to do a project work with an unknown individual and I need to look this person up on social media. It is too difficult to do group work because of distances.

B: We do projects on *Google Docs* and we can edit the texts documents we work on together. We don't need to meet live on *ZOOM* but it is weird. I am here, doing project work on something with someone else that I cannot even see.

Z: The weirdest thing about online group work is the fact that you need to do everything alone. You are left on your own to complete all of your assignments and exams. I feel that I am the only person who does it. You can see this clearly in group work because even if you do a presentation with another person online, the truth is that you do it all alone.

L: I miss the conversations that you have in corridors at university. You do small talks with other people even at the end of the class but now when the lesson online it is over, it is over and I remain here in my room.

- **Was there a moment when you felt you were leading the activity? Conversely, did you ever feel that your contributions to the activities were useless?**

H: For my experience with *(says the name of one of the participants)*, I felt in sync with his ideas. His ideas were good and when he was proposing his ideas, I was agreeing with him without feeling obliged to do so.

I: I felt exactly the same. I felt we were equal.

B: We did the same, we answered together, it was nice.

- **What are the most challenging aspects of remote learning?**

B: I would say that despite the fact that we can see the other person we cannot see the body language and it is difficult to know what to say and when to say it. Especially if people turn the camera off. I never know whether to turn off or on the camera and it seems awkward compared to normal life.

L: I don't have the concentration to stay in front of a screen for the whole day. All the work I am doing takes more time. It is difficult to do all the readings and read in front of a computer. My time to relax is limited and I feel that I lose it because instead of relaxing I consistently work.

I: When we were at uni we had time to walk to another class and talk to one another but now, it's not that we do not have time to do this, but now all classes end at the same time, we paradoxically have more time but less time to relax. And this makes me angry.

H: I think the incapability to chit-chat with your friends is a great loss. I feel it. I feel it to be different. I cannot ask my friends for clarifications during a lecture. It is way too difficult, interacting online.

Z: I saw that even if everything is online university teachers give us a lot of homework. They believe we have more time. Now we have more to do. Lectures are longer. I don't know what happened, but there is too much to do.

B: It's strange to see another person's room. It distracts me and it's weird.

FOCUS GROUP C

Since this interview was conducted in English, verbatim transcriptions are provided.

- **Did you like these activities?**

Some of us are arts scholars so we liked the activity. I think it was useful to use virtual museums in language classes. I liked the images behind the *Google Arts* activity. I would have liked to know more about the history and the content of the painting. It would have been nice to have gathered more information on the paintings in Italian.

- **How would you describe your partners' interactions during the activity?**

We all know each other so this made it easy to interact. We only met in this class but we have a *WhatsApp* group and managed to make quite good connections despite never having met in person.

It was a pity to only have one person doing the presentation of the group work, it would have been different in in-person class where everybody could present some of their work. Plus, I was confused in the first activity because I did not understand what we had to do. We had a good idea of taking a group picture instead of a portrait one. But then I made the suggestion of the painting and everyone followed. *(Says one of the participants' names)* was right most of the times in terms of studying the painting, she had very good ideas we kind of went with what she pointed out, which is good. The ID part [the 1st part of the task cycle] was more of a negotiation.

It would have been better to place the ID [the 1st part of the task cycle] at the end of the session because it would have given us more sense of purpose, it would have made more sense logically to bring what we had seen on the artwork back in the now. It would have brought more interactions through comparisons.

Kahoot! is not good to engage people so I felt a bit useless at it because I do not understand what do I do with the information that the quiz brings to me. This is related to the way that it is structured. It works better in bigger groups, with seven people it is a bit demotivating because if your name isn't there, there is a problem.

- **Was there a moment when you felt you were leading the activity? Conversely, did you ever feel that your contributions to the activities were useless?**

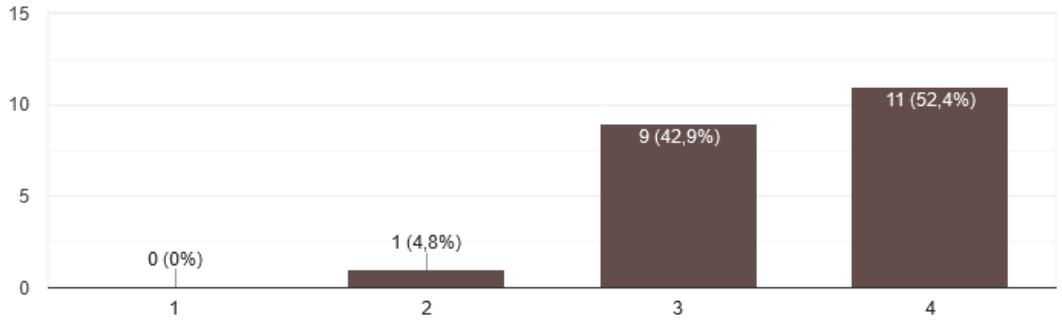
I was definitely the leader, I made the decision, but also the others participated, so I was not the only one leading the group. *(Says one of the participants' names)* is always a bit quiet so he was quite happy with his role.

I felt useless because my proceeding logic was different from the others, so when we had to do the ID of the good governor, I moved through the document is different ways than the others.

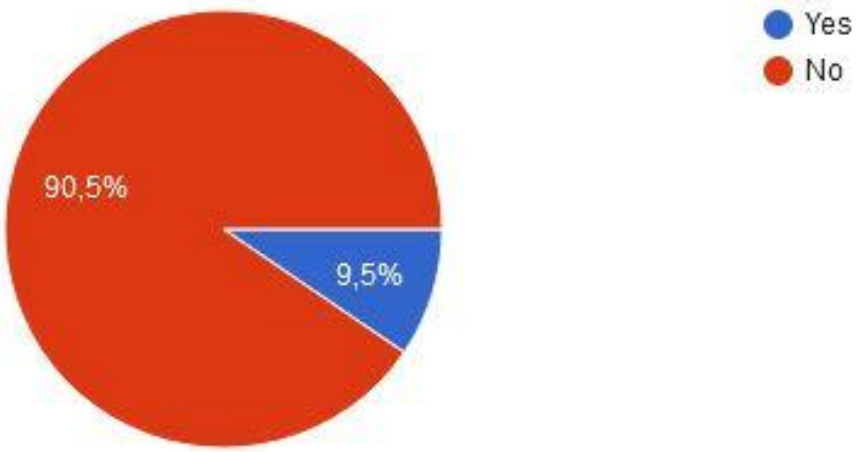
APPENDIX G. QUESTIONNAIRE RESULTS

Results from the online questionnaire have been transcribed as they were provided by the students. The terms *Google Arts* or *Arts & Culture* were used by the students to refer to the application *Google Arts & Culture.*

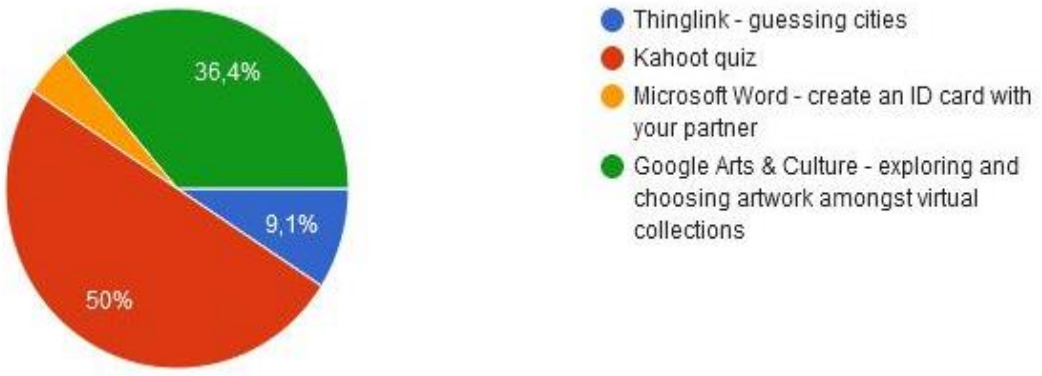
How easy was Google Arts & Culture to navigate? *



Before this activity, had you ever used virtual museums to create class content?



Which part of the activity was your favourite? *



Could you describe why you liked it? *

Nice to interact virtually from my phone to the quiz!

I didn't understand the first 2. I understood the second after we completed it.

It was creative, and we got to spend more time interpreting a specific painting. I also liked that we were challenged to write a presentation in Italian.

This activity offered the most opportunities to speak, debate and learn vocabulary. I find it easier to have more freedom to use the vocabulary I know in discussion rather than answering questions that are too narrow or precise.

Good to think through the art and then to relate the content back to the wider group.

It was fun.

It was interesting to browse virtual collections and use Italian vocabulary to talk about the artworks.

I liked the freedom of choice to be able to talk about what I found interesting. I could practice my grammar and expand my range of vocabulary in terms of describing class, power and politics.

It pushed us to think creatively rather than passively participating, and it was entertaining due to its being visual.

Very competitive.

I liked being able to navigate through different colour schemes as I think using colour as a way of grouping pictures makes it easier to find an image to fit whatever meaning you need it to fit.

It was very interesting to learn about Venetian art history, especially about the symbols of the city. *Google Arts* was easy and interesting to use, and the *Kahoot!* quiz was a fun way to test our knowledge.

Fun and interactive.

Divertente. *(fun)*

I enjoyed the interactive side of it and the fact that it required reasoning.

Because I didn't have to worry about anything technical, if you make a mistake or have a technical issue it can be quite stressful as you can get lost quickly.

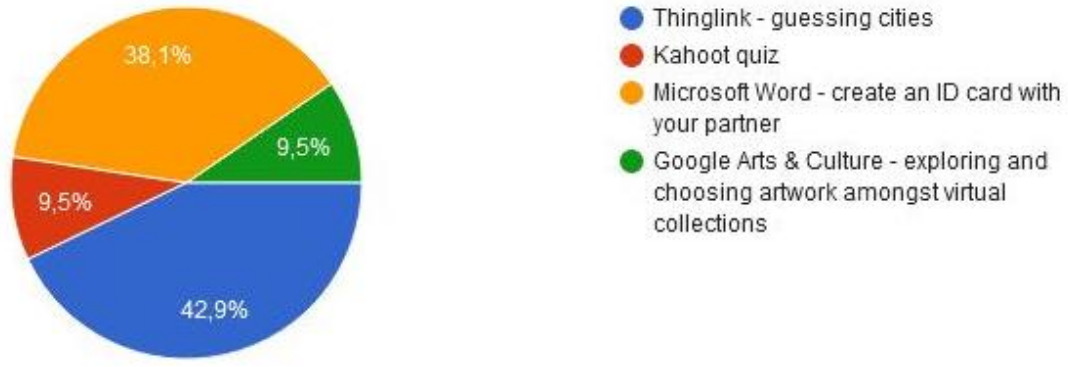
Interactive.

Interactive, educational.

It was a fun, interactive task, which helped with how to use *Arts & Cultures* and also found out something interesting.

Learning with the motivation of the competition is quite entertaining, it actually makes me wanna learn more.

Which part of the activity did you like the least? *



Could you describe why you didn't like it?

Sometimes it’s hard to interpret the paintings if you don't know much about the background of the person/painting.

I didn't understand what we have to do.

I didn't understand what was asked of us.

There is so much to choose from and discuss in this activity. It would have been easier to have longer to choose a painting and perhaps smaller groups. I think the parameters of the activity were too broad so it was difficult to focus the discussion.

Felt a bit short, but a good start!

/

I liked the idea of it but maybe it could have been slightly longer or we could have seen more images to guess the location.

I found this task quite difficult as I could not really find the right words to describe each figure, and I hadn't come across the pictures before, so had to Google them for more information. I also found that when we were being supervised by the tutor, there was a bit more pressure to think on the spot, which made it difficult for me to process my thoughts on the paintings.

It was almost too easy, as the painting and the actual picture of Venice overlapped almost entirely.

I loved and enjoyed all of them, I picked the exploring and choosing artwork amongst virtual collections not as my least favourite but as my second favourite because it was very interesting hearing the different opinions of others about what *Doge* should rule a government by just looking at the painting and analysing them.

It was quite easy.

Difficult to describe someone who I had never heard of before

Era difficile trovare l'informazione sul doge. *(It was difficult to find information about doge)*

I'm not the fastest reader so it was tricky to read the question then go to the virtual museum to find the answer, then click back to the quiz to see the answer options below and match it to a shape/colour on my phone. For me it was a bit of a faff.

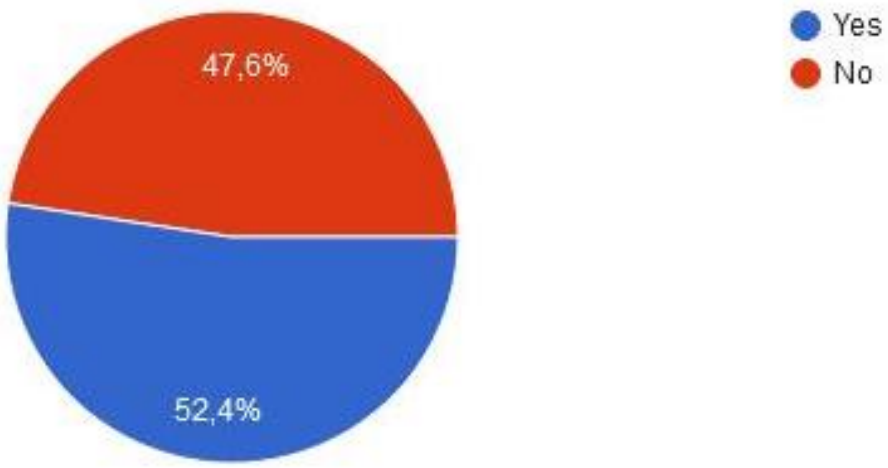
It was quite easy.

I didn't find the questions very stimulating.

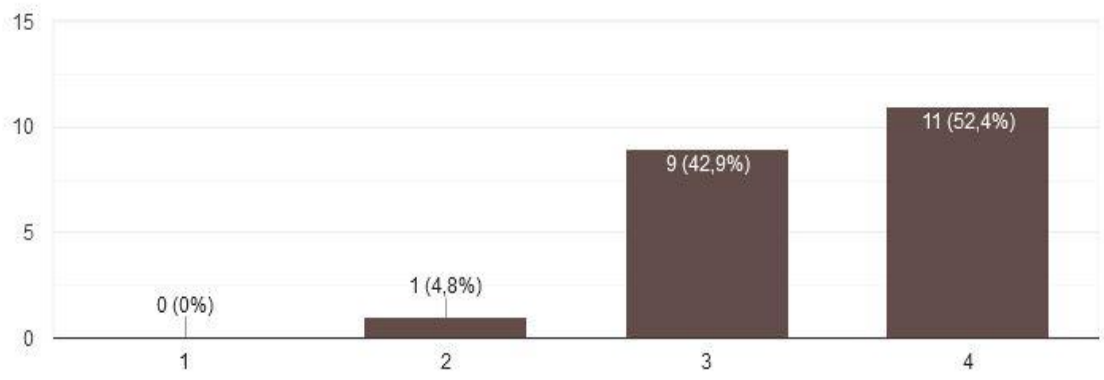
It was very short! Maybe some more images or more information about the cities would have been helpful.

I found it was not totally well structured as we were voting for a city before being able to see all of them so I was confused at the beginning.

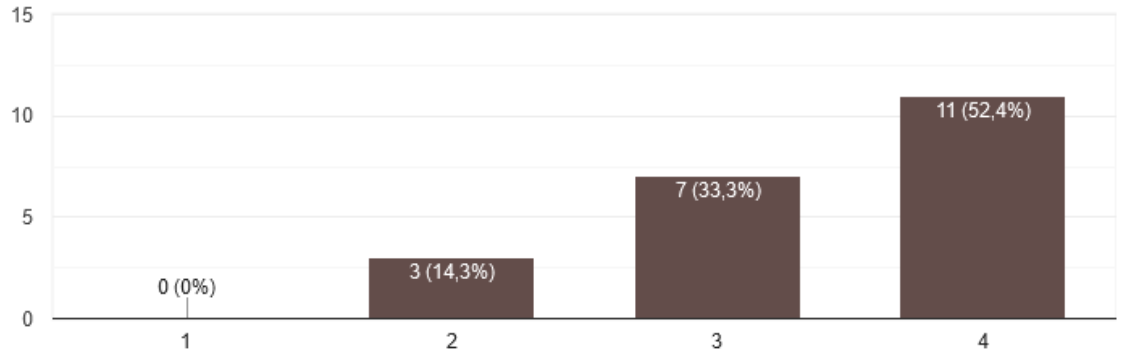
Was this the first time that you worked together with other students on website content during language classes?



Did you feel that virtual environments stimulated interactions with your peers? *



Were virtual museums helpful in making you interact with your partners? *



Could you describe why you think so? *

We were able to view the same paintings at the same time and therefore able to comment and share ideas.

It is easy to have access to and navigate around.

We had access to the same info, and it was easy to collaborate.

I don't think a virtual learning environment on a virtual platform is necessary to engage with other students. I found it a little confusing to interact with so many different websites and use *ZOOM* at the same time. I felt less connected to my classmates in navigating these other sites because there was less opportunity to simply talk to them and my attention was split between different activities. I enjoyed the content, but I think I would have been more comfortable with using images as a prompt for discussion rather than the structure of the activity. Too many programmes at once detracts from the lesson because the instructions required to operate the platforms need to be precisely followed which is difficult at a distance. Personally, I do not find the competitive element of *Kahoot*! very useful. I would rather learn vocabulary through conversation and reading. The *Google Arts* platform would have been more useful if there were descriptions in Italian of the art.

A different way of doing things and engaging with content/vocab.

No. Took too much time navigating the screen.

We had to discuss the virtual artworks together and work with one another to produce text.

They were really engaging, and allowed us to explore content individually whilst also giving us something to discuss altogether. In the task where we could decide on a painting, it was great as it allowed us to find our own examples, and then communicate our ideas with each other together.

Because being part of a group stimulates collaboration, which was particularly interactive due to the content.

by sharing links between each other to navigate on the website and look at for example, the pictures and so on.

It's visual so it makes it quite easy to engage. As something like museum artefacts isn't a "heavy" topic, it also makes it easier to discuss as not only is it easier to voice your opinion but it's also more comfortable to not agree with your partner.

Even though we can't physically visit museums, the virtual tour was really well done and still gave us 360 vision with explanations of artworks. It was easy communicating with my classmates and discussing artwork, except when my computer crashed on me!

Provided content and topics to talk about.

Un po', perché dovevamo navigare il museo insieme. *(A little, since we had to navigate the museum collections together)*

Because we had the chance to observe the same thing even though we were in completely different locations

We interacted but a lot of it was from navigating the site and understanding the activities.

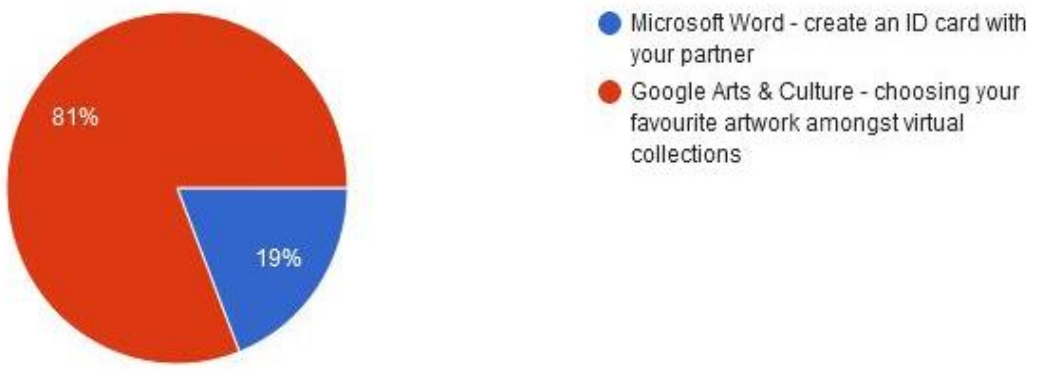
Because we had to talk about different things together.

Because it gave us something to talk about and share opinions about.

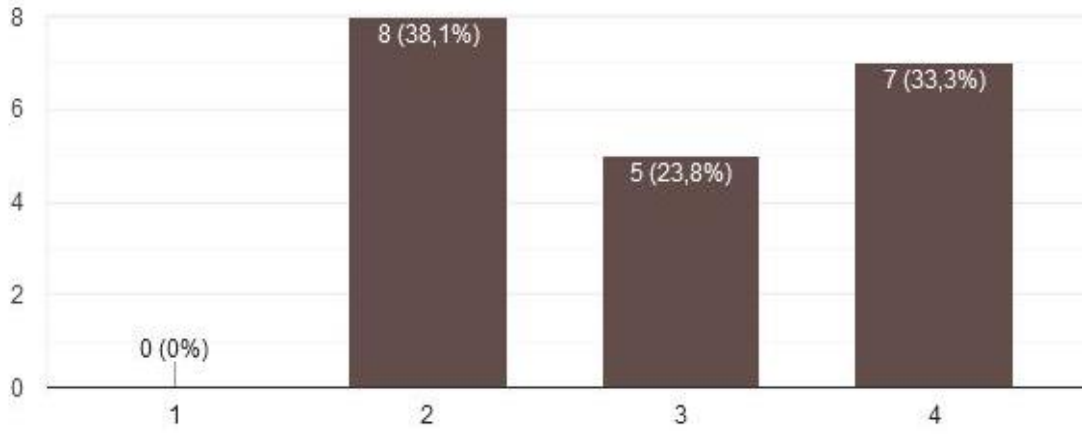
It was a nice shared experience to share something on the screen with my partner, as we can't share things together, particularly at the moment.

Having to do an activity from out of the workbook with my partners motivated me to interact with them in an environment which was different that the one we have in another class.

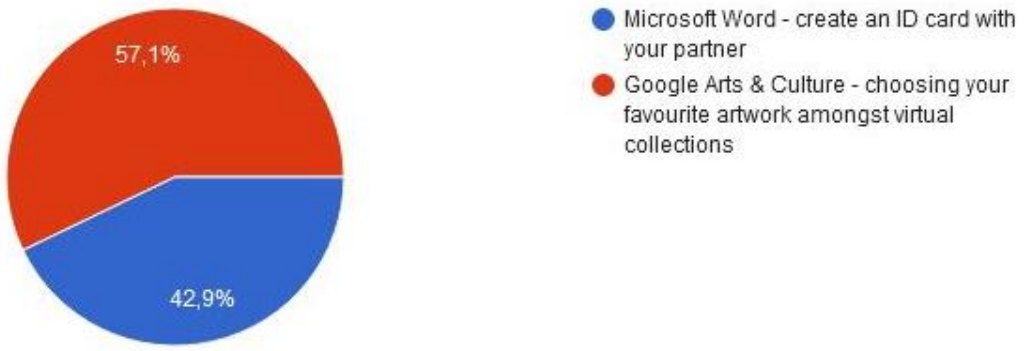
During which activity did you feel that your partner offered the most interesting ideas? *



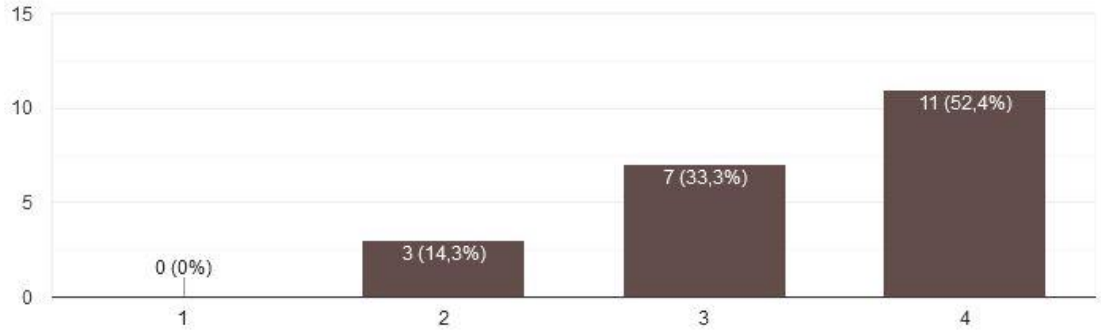
Do you feel that the use of Italian facilitated interactions? *



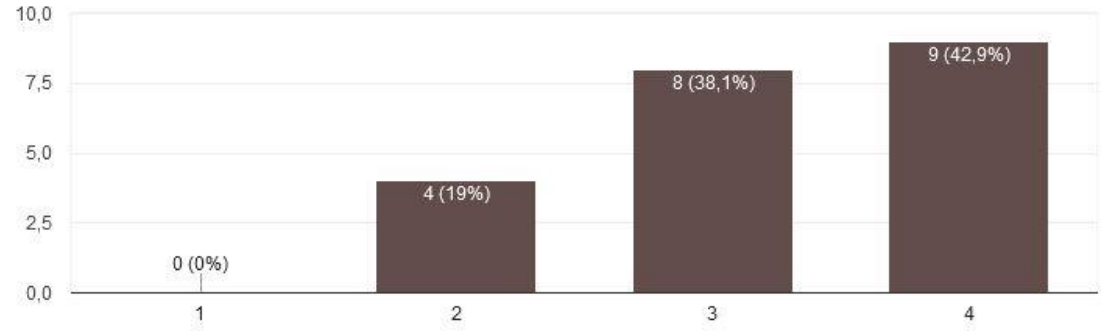
In which of these two activities do you think you deployed your team-work skills the most? *



How do you rate your group engagement in the activity? *



Do you feel that your contribution to the group conversations made it easier to achieve the goal of the activity? *



In which way? *

I gave my opinion on the *Doge* paintings and added another perspective to the group discussion by pointing out different aspects.

Share ideas.

We all worked together and it was a good atmosphere. I can be quite direct but the others held their own. I felt like it was a productive session.

I'm not sure that these questions accurately reflect my experience of this class format. Discussions in smaller groups would have been more useful. Feedback from everyone, rather than just one person would also be preferable. The group dynamics were more difficult than they usually are during this class online as the structure of the activities constrained more organic conversation. I think that having too specific an aim in group tasks facilitates dominant voices in a group rather than equal interaction. Perhaps these activities could be more finely attuned to the level of each group and the existing relationships between peers. I don't think that virtual learning environments will have the same benefit for every language group and structuring lessons too closely according to external websites only offers one mode of teaching.

Tricky sometimes on *ZOOM* to know when to speak, but that is more a problem with online calls than with the activity!

I am art historian, love to analyse paintings.

We had a set amount of questions to look at so it was clear what our goal was and what was required.

I spoke a lot in the group rooms, and guided the discussions.

It helped us discuss and compare our opinions and ideas so that we could find common ground on the matter

By expressing different opinions.

By questioning choices so we think about it more deeply and are more likely to come to the right conclusion.

We each had our own interpretations of artworks during the activity, and discussing them as a group made interesting conversations and ideas.

The class is more beneficial when multiple people participate.

Credo che penso fuori dagli schemi. *(I believe I think outside of the box)*

Communication is always key.

Asking questions that were beneficial for everyone.

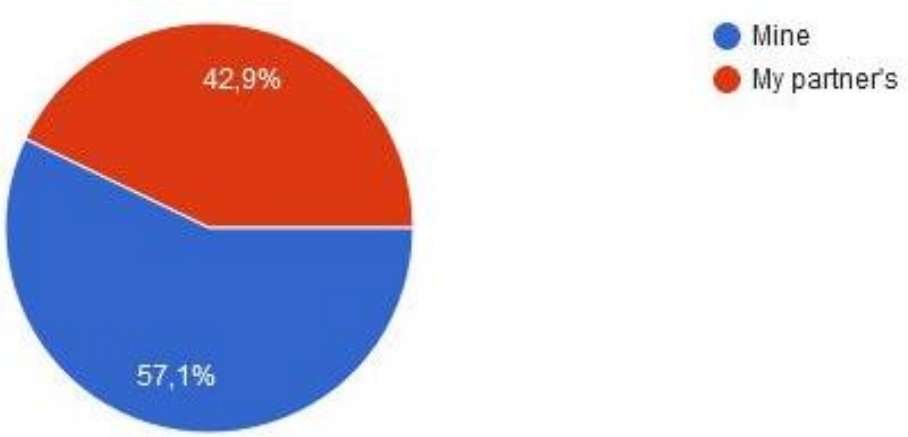
I gave a few good ideas.

sharing opinions and ideas help others reflect on their own.

Due to my level of Italian I find I hold myself back slightly in discussions, but it is breaking through that barrier that helps improve my language skill and so I am constantly trying to do so.

As it was not a technical question at all, my contribution was not so useful, just with the ideas of one person of the team could be enough.

Would you describe the choice of painting as more "yours" or more the result of your partner's contribution? *



How? *

I expressed my view that the Doge Marco Foscarini was the most suitable for the role as his posture and facial expressions were very convincing and perfect for the role he had to undertake compared to all the other Doge paintings.

I suggested to use this one.

We wanted a communal scene to portray democratic ideals. I suggested the painting for its multicultural angle.

The group is too large and the choice of painting too broad to allow for long discussions.

We went for a picture showing the Doge in a group, which was something we talked about together.

He/She found it faster.

When selecting the artwork, there wasn't a huge amount of time to browse so I was happy to go with what my teammate selected. It was a lovely painting!

I chose this painting first, as I had made my mind up before the other members in my group.

I showed the painting at first, and after a comparison with a few more, we ended up collectively choosing mine.

We all had different ideas and opinions.

My partner has a better understanding of art.

I lost my connection to the zoom call for a few minutes and lost my tabs.

My partner had a good idea and therefore made the final choice on the painting (but I still agreed with them).

L'ho trovato *(I have found it).*

He was able to find a very representative painting and I was able to contribute given my personal interpretation of the artwork.

They chose it first with a good reason.

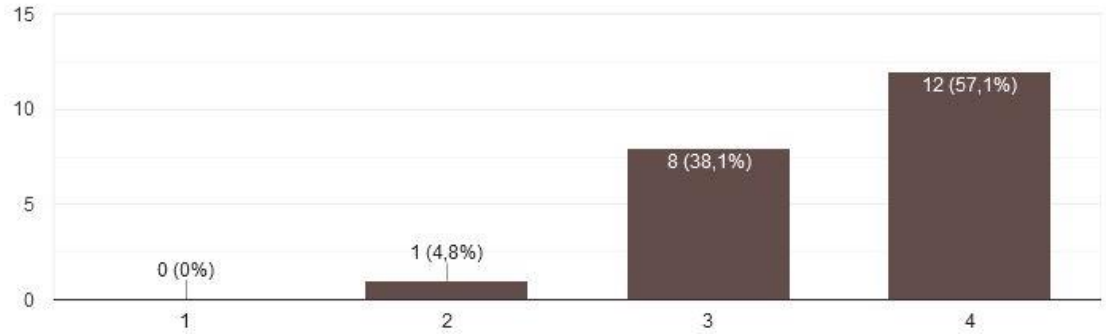
I said that we should study it

I think we were all very flexible but I just happened to have the last say.

I suggested another painting but my partner had more to say on their choice so we went for that one.

I gave an idea which my partner really liked so we ended up choosing that painting.

Did you feel satisfied about the painting that your group chose? *



Could you explain why you felt satisfied/dissatisfied?

I chose it initially and explained my view to the group and they agreed with me!!
it has many symbols.

We came up with lots of interesting ways of looking at it.

I think that any painting would have been good for the discussion. The choice of the painting is less important than the opportunity to talk. Despite this, I felt some tension over the question of choosing the 'right' painting which seemed to disrupt the conversation as the activity became more goal-oriented than exploratory. Perhaps a smaller range of paintings or an activity which asks students to compare several paintings, or a more open-ended activity such as 'choose a painting to discuss' would have been less stressful.

Plenty to say about it, an interesting image and a good conversation with some helpful insights.

It was a good painting.

There was a lot to talk about in the painting... and most of the options would have been satisfactory anyway.

There was a lot to talk about within the painting, which stimulated discussion and made way for differing interpretations.

Because it was my initial idea and it represented my opinion, and I was glad others agreed with me, even a person from another group.

Satisfied of my own choice ahah and had good explanations with it, my group also had different views and opinions.

I think the term 'buon governante" is very subjective to the time period, so I feel the painting we chose reflected what this phrase would mean to someone in the 1700s but not so much to someone of today. Therefore, it is difficult to comment on whether I'm satisfied/dissatisfied.

The painting was a good choice, perfectly depicted the coronation a new leader for Venice.

The painting matched the aim of the activity.

Rappresenta il passato e il presente. *(He represents the past and future)*

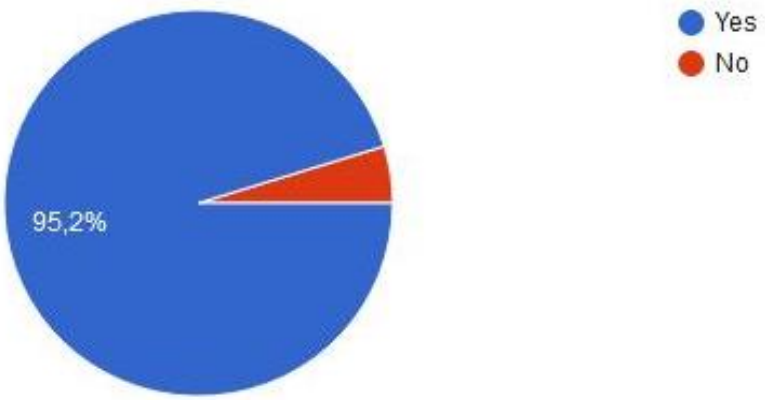
The reason for choosing it made sense but I don't feel like I have a good enough knowledge of Italian history to understand the paintings well enough to give a proper answer.

Was easy to analyse.

I though the painting we picked reflected our ideas.

The reasons that we mentioned for choosing that painting were not representative of my personal values for a good leader.

Do you feel that you allowed your partner enough time to speak during conversations? *



Did you enjoy this virtual activity? *

If you answered "YES", could you describe why? (write "n/a" if you answered "NO")

I learnt a lot about venetian art and about the role of a *Doge*. Furthermore, it was nice to discuss different ideas about the paintings and compare everyone's point of view. The zoom breakout room was also a nice touch to the group call, I had never used this before.

because we were trying to find the symbols
It was fun and felt very easy going. I also really like the people in the class and feel we all get along very well.

I enjoyed the content which is very interesting. But I did not enjoy the activity.

It was something a bit different! I enjoyed the ability to feedback as a group afterwards.

Although I had huge fun doing it, equally I found it a bit too gadgetty and time consuming. Especially trying to navigate content, tasks, tabs, phones, leaving a very little time to concentrate on Italian.

I liked the amount of choice involved and the exploration of a particular gallery collection.

I enjoyed this activity because it gave us independence, and I didn't feel to rushed trying to describe the paintings. In the ID task, I ran out of time because I couldn't articulate myself properly.

It was engaging and it pushed us to think creatively, and I think that in this kind of set up it's easier to break language barriers.

Very different from what we usually do during our Italian classes and very interesting and good content.

I found it was very easy to engage with because of the nature of the topic, the argument about it not being a "heavy" topic that is presented above is why I enjoyed it.

It was interesting and fun.

Much more interactive than a typical class and therefore more memorable

È bello fare qualcosa che non facciamo normalmente *(It is nice to do something we do not normally do)*

I've enjoyed this activity since it gave me the chance to get in touch and collaborate with my peers which is something rare nowadays.

It was good to interact with peers.

Nice to talk to other students

It was educational and fun

It was interesting and interactive, and I enjoyed the themes that we covered. It would have been interesting to learn more facts about art history, and I enjoyed learning more about the details in the portrait of Obama. It is always enjoyable to practice Italian in a more informal setting, and the subjects that we covered were different to those we usually discuss in class. I enjoyed using *Arts & Cultures*, as someone mentioned in the focus group it was a good opportunity "viaggiare online".

I enjoyed it because we had to think in a creative way to find the most appropriate way. The game was not only about the Italian language but also about the culture and art.

If you answered "NO", could you describe why? (write "n/a" if you answered YES)

N/A

Usually, the interactions among peers in this class are very relaxed because there are multiple opportunities to discuss different things. This activity was more complicated and took longer and so only offered one opportunity to speak.

N/A

Do you have any suggestions to improve this virtual activity?

No.

n/a

Explain the first exercise (about Italian cities) more clearly, I thought the Canaletto painting in the background was a background image and nothing to do with the photos shown of different cities. Maybe I wasn't paying enough attention!!! but I did it wrong.

The fact that during the *Kahoot!* the website we were looking at was not in Italian really threw me off. I think next time a source in Italian would be helpful.

Personally, I just don't enjoy lessons structured around other virtual platforms during lessons online. The online format is already so different. In person, perhaps this virtual environment would be more useful. I think that these platforms are too complicated to use in groups, but would be very interesting to use as illustrations to a less technological

activity or as support for individual study. Despite all this, I did enjoy this introduction to *Google Arts*. Thank you for creating a lesson for us!

Maybe have slightly smaller groups - perhaps only two people if that is possible, to allow better conversation and interaction, and to hear about more paintings!

I would recommend it occasionally as a fun and relaxation during the language course, but not as a learning tool.

Maybe each individual could contribute some information about the painting
rather than one individual, but I understand this may impact on the time!

Perhaps I would give more information on the ID card task, as it was unclear initially what was expected of us and how this related to the other tasks that we were doing.

Maybe making the first activity a little bit more challenging, choosing a site that is not entirely similar to what it was in the painting.

No, it was very good

For the comparison of Barack Obama and Doge maybe the Doge painting could've had more going on (like the Barack Obama one) so there would be more to discuss, but that's just me being very picky :)

Maybe give us some background info on the Doge and that period in Italy to help us complete the tasks.

Put a shorter answering time on the *Kahoot!*

More time spent exploring *Google Arts & Cultures* would have been nice, I don't think the *ThingLink* activity was particularly engaging.

No