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Golden triangle of evidence-informed education technology with EDUCATE

Review of Semantic Web technology use in formal education

Grading students’ programming and soft skills with open badges

Factors underlying students’ decisions to use mobile devices in clinical settings

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L1 versus L2 online intercultural exchanges for the development of 21st century competences: The students' perspective

Ana Sevilla-Pavón 

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Abstract

The myriad of possibilities brought about by the advent of Web 2.0 in terms of communication and interaction have revolutionised educational practices over the past few years. One of the most promising educational approaches resulting from this revolution is online intercultural exchange or telecollaboration, which has been reported to contribute towards the development of 21st century competences. Many of the benefits of online intercultural exchange have been extensively explored in the literature and numerous studies have been carried out. However, very few studies have looked into the differences between an L1 or mother tongue exchange and an L2 or lingua franca exchange as far as the development of 21st century competences is concerned. This paper aims at filling this gap by exploring and comparing the results of two configurations of Online Intercultural Exchange carried out over a period of 4 months with 125 participants. The results indicate that the L1 exchange was perceived as more beneficial than the L2 exchange for most of the competences studied (linguistic and communicative competences, Language for Specific Purposes learning, learner autonomy and teamwork). Meanwhile, the L2 exchange was considered as more beneficial for the development of intercultural competence. Furthermore, no significant differences were observed regarding digital literacy.

Introduction

Over the past few years, educational practices have evolved at an unprecedented fast pace and learners from all over the world are just one click away from global communication and interaction and their related opportunities (Levy & Stockwell, 2006). Some of the latest approaches which have been made possible or enhanced thanks to information and communications technologies (ICT) include learning through augmented reality, gamification, flipped classroom approaches and telecollaboration or online intercultural exchange (OIE). This paper deals with the latter approach, the relevance of which is increasing exponentially, as shown by the fast-growing body of research on OIE and the emergence of a professional association, Unicollaboration, as well as dedicated conferences in recent years. In this respect, OIE has shifted from the fringe to the core of language teaching practices in numerous institutions (O'Dowd, 2011, 2016).

In spite of the relatively high number of publications and studies examining and dealing with different benefits of OIE for learning (Eck, Legenhausen, & Wolff, 1995; Hauck & Youngs, 2008;

Practitioner Notes

What is already known about this topic

- Online Intercultural Exchange (OIE) is one of the latest teaching approaches made possible or enhanced thanks to ICT and is at the core of language teaching practices in a growing number of institutions worldwide.
- The relevance of OIE is increasing exponentially, as shown by the fast-growing body of research focused on it and the emergence of a professional association, Unicollaboration, as well as dedicated conferences in recent years.
- OIE literature has reported gains in terms of language learning through exposure to authentic input and direct contact with the target language; preparation for a physical mobility exchange; development of 21st century skills; and language development, accuracy and fluency, among others.
- The differences between L1 and L2 OIE configurations in terms of the perceived gains for learning and, specifically, the development of 21st century skills as reported by the participants themselves still remain underexplored.

What this paper adds

- This the first bigger-scale study aimed at determining whether there are differences between L1 and L2 configurations as far as the perceived gains for learning are concerned and, specifically, the development of 21st century skills.
- The differences between each configuration (L1 or L2) are analysed regarding the students' self-reported development of 21st century competences: digital literacy, teamwork, intercultural competences, intercultural communication, linguistic and communicative competences, Language for Specific Purposes learning and learner autonomy.
- In contrast to previous studies, which had been carried out with limited numbers of participants and have tended to focus on just one configuration, this mixed-methods study has a comparatively high number of participants ($N = 125$) and explores two kinds of configurations instead of just one, thus allowing for a wider generalisation of results.
- The results indicate that the L1 configuration was perceived as more beneficial than the L2 configuration for linguistic and communicative competences, LSP learning, learner autonomy and motivation; whereas the L2 exchange was considered more beneficial for the development of intercultural competence. No significant differences were found regarding digital literacy.

Implications for practice and/or policy

- The significant differences regarding the perceptions of the students' development of different 21st century skills point out the convenience bearing in mind the goals of the OIE when choosing the kind of configuration to be followed. This should be done with a view towards choosing a configuration that is better suited to the students' needs, characteristics, interests and expectations.
- In the case of OIE aimed at developing linguistic and communicative competences, fostering LSP learning or increasing learner autonomy and motivation, the results seem to indicate that an L1 configuration might be more suitable, as significant differences were appreciated between the two groups of participants.

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- In the case of OIE aimed at developing intercultural competences, the results seem to indicate that an L2 configuration might be more suitable, as significant differences were appreciated between the two groups of participants. Nevertheless, the results also indicate that an L1 configuration might also contribute positively to the development of intercultural competences.
- As far as digital literacy is concerned, the results seem to indicate that both OIE configurations are equally suitable, as no significant differences were found between the two groups of participant: both L1 and L2 seem to equally contribute towards developing students' digital literacy.

Kern, Ware & Warschauer, 2004; Kern & Warschauer, 2000), very few studies have attempted to explore the differences between L1 and L2 exchanges in terms of the perceived gains for learning and, specifically, the development of 21st century skills as reported by the participants themselves. Twenty-first century skills include life and career skills; learning and innovation skills; information, media and technology skills (Partnership for 21st Century Skills [P21], 2009). While most previous studies have focused either on exchanges between non-native speakers (NNS) (Ke & Cahyani, 2014; Sevilla-Pavón & Haba Osca, 2016) or between native speakers (NS) (Belz, 2003; Belz & Thorne, 2006; Dooly & Sadler, 2013; Sevilla-Pavón & Haba Osca, 2017), the differences between both kinds of configurations remain widely unexplored, with very rare exceptions. Among those, Ke's (2016) small-scale study aimed to determine how a multilingual OIE influenced participants' identities. This author found that students felt more comfortable in the NNS configuration, whereas they experienced higher levels of anxiety in the NS configuration. Since the OIE configuration followed might affect the outcomes, making the right choice is important in order to ensure that the configuration adopted is suited to the project's goals while catering to the students' needs, characteristics, interests and expectations. In order to further explore the differences between NS and NNS OIE so as to provide empirical support to address this issue, two bigger-scale simultaneous OIE were set up: an L1 exchange between 47 students from Universitat de Valencia (UV) and Wofford College (South Carolina, USA); and an L2 exchange among 78 students from UV and Cyprus University of Technology (CUT), Cyprus. This paper explores and compares the results of these simultaneous OIE projects carried out over a period of 4 months with 125 participants.

Online intercultural exchanges: Goals and scope

OIE or telecollaboration can be considered umbrella terms covering various learning activities, tasks and configurations. These involve synchronous and asynchronous multimedia exchanges through the use of online communication tools among students from at least two different physically and geographically dispersed classes (Belz, 2003; Kinginger, 2004), set up in an institutional context "with the aim of developing both language skills and intercultural communicative competence [...] through structured tasks" (Guth & Helm, 2010, p. 14). In these exchanges, students collaborate while co-producing mutual objectives and sharing learning (Sadler & Dooly, 2016).

The last 20 years of foreign language instruction at different educational levels have witnessed an increase in importance and complexity of OIE, even though educators outside foreign language teaching still remain rather unfamiliar with it (O'Dowd, 2016). It started off as simple keypal relationships among geographically dispersed students who collaborated and exchanged information. Nowadays, it involves the use of Internet tools such as virtual learning environments, virtual worlds, email, chat, web conferencing, web page building, as well as audio and

video conferencing. As a consequence of this, OIE can be seen as one of the most comprehensive and complex activities in the field of learning with technology. This is due to the wide variety of ICT used in the exchanges; the complexity and diversity of the tasks completed by the participants in the exchanges; the multiliteracies and competences involved in the completion of the different tasks; and the wide number of variables beyond the control of teachers and practitioners during the exchanges (reciprocity, communication breakdowns and intercultural communication issues, to name a few).

Two main configurations of OIE can be distinguished:

1. L1 or mother tongue exchanges, in which the participants are native speakers of one of the languages that is being learnt and exchanged.
2. L2 or lingua franca exchanges, in which the language of interaction among participants is not their native language but their target language, that is, the language they are learning.

In spite of the fact that the benefits of OIE have been extensively explored in the literature and even though numerous studies have been carried out, no previous studies have attempted to establish the differences between L1 and L2 exchanges regarding the development of 21st century competences. Numerous examples of OIE projects found in the literature have reported gains in terms of exposure to authentic input and direct contact with the target language (Eck et al., 1995; Hauck & Youngs, 2008; Kern, Ware, & Warschauer, 2004), preparation for a physical mobility exchange (O'Dowd, 2013) and language development, accuracy and fluency (Kötter, 2003; Lee, 2006), among others. The current challenge lies in determining whether there are differences between L1 and L2 OIE as far as the perceived gains for learning are concerned and, specifically, the development of 21st century skills as reported by the participants themselves.

Research hypothesis

It was hypothesised that there would be significant differences in the scores of the perceived benefits of L1 and L2 OIE for learner autonomy, digital literacy, teamwork, intercultural competences, linguistic competences and Language for Specific Purposes learning.

Methodology

A mixed-methods approach was adopted. Data were collected by means of preintervention and postintervention questionnaires (Appendix 1) as well as focus group interviews (Appendix 2). The quantitative data obtained by means of the postquestionnaire constituted the basis for the present study. This analysis was supported by qualitative data from the participants' comments about their perceptions of different aspects of the exchanges in both the open-ended questions of the postquestionnaire and the focus group discussions. The sections of the postquestionnaire and the questions of the focus group interviews will be discussed in the "Data gathering" subsection. A Student's *t*-test was conducted in order to measure whether the means of the participants' perceptions varied in accordance to the OIE configuration (L1 or L2).

Participants, context and task design

The OIE dealt with in this paper were supported by the Lifelong Learning and Educational Innovation Service at the University of Valencia, and the Valencian Regional Government (Generalitat Valenciana), Spain, and took place over a period of 4 months, from September to December 2015, with 125 participants ($N = 125$) aged between 17 and 25 who answered a pre-questionnaire and postquestionnaire as well as different focus group questions. They belonged to two different groups of students from the Universitat de València (UV, Spain), one group of students from Wofford College (South Carolina, USA) and two groups of students from Cyprus

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University of Technology (CUT, Cyprus). The students were distributed in different groups and subgroups: 47 students ($n = 47$) participated in the L1 exchange (15 from Wofford and 32 from UV); and 78 ($n = 78$) students took part in the L2 exchange (28 UV students from two subgroups who were paired up with 29 and 21 CUT students respectively).

The configurations of the online intercultural exchanges were as follows:

L1 exchange: 47 ($n = 47$) students took part in the Wofford-UV OIE and filled in the postquestionnaire. Since it was a mother tongue configuration, the Spanish UV participants (International Business Degree) and the American participants from Wofford (mixed degrees) interacted and communicated both in Spanish and English in the "Wofford-UV" Google+ platform.

L2 exchange: 78 ($n = 78$) students took part in the CUT-UV exchange. Spanish UV participants (International Business Degree) and Cypriot participants from CUT (Hotel and Tourism Management Degree and Mechanical Engineering Degree) interacted and communicated in English in the "SCI-TEL" and "CSI-TEL" Google+ platforms.

UV students were randomly assigned to either of those two groups. As explained earlier, each group participated in a different exchange (either L1 or L2). The 60 UV students were studying their first year in International Business and had a B2 level (Upper-intermediate) of English on the Common European Framework of Reference for Languages (CEFR) (Council of Europe, 2001). The 15 participants from Wofford College were studying different degrees, majoring in Finance, Biology, Chemistry and Psychology with a minor in Spanish. They were in their third year and their level of Spanish was B1 (Intermediate) on the CEFR (Council of Europe, 2001), although some heritage Spanish speakers had a higher level of spoken Spanish. Finally, 29 participants from CUT were studying a degree in Hotel and Tourism Management, whereas the remaining 21 participants from CUT were studying Mechanical Engineering. In both cases, CUT students were first-years and their level of English was B1 on the CEFR (Council of Europe, 2001). The CEFR scaled proficiencies were established by means of in-house produced written tests focusing mainly on grammar and vocabulary.

Students were assigned different telecollaborative tasks on a weekly basis. These were embedded in their respective Language for Specific Purposes (LSP) modules. Furthermore, they were designed from a socio-constructivist approach (Vygotsky, 1978) with a view towards supporting collaborative inquiry while being authentic, challenging and meaningful (Sevilla-Pavón & Haba Osca, 2016). Moreover, they were aimed at encouraging negotiation processes through community members, thus enabling them to co-construct knowledge through discussion and collaborative work (Romanó, 2003; Sevilla-Pavón, 2015).

As for the task typology followed, it was O'Dowd and Ware's (2009), featuring online interactions and discussions of different topics on the project's Google+ Community in order to complete the collaborative tasks; the creation of a digital story; and the delivery of an oral presentation about an innovative product or technology (Sevilla-Pavón & Haba Osca, 2016).

The participants interacted over a period of 14 weeks both synchronously and asynchronously. Asynchronous communication took place weekly in scheduled lesson times lasting around 1 hour through the online forum on the Google+ community, email exchange and GoogleDocs comments. Meanwhile, due to time differences and constraints, synchronous communication took place out of class through Google Hangouts, which allowed for videoconferencing, as well as text and voice chat. The Hangouts exchanges were scheduled by dyads of students outside of scheduled lesson times. Their length varied according to the complexity of each collaborative task, ranging from 10 to 40 minutes. In the case of the L1 exchanges, students were told to speak in each language for the same amount of time, while the participants in the L2 exchanges interacted in English the whole time. Since participants in both the L1 and L2 OIE interacted in their

target language for the same amount of time, the interactions could have been longer in the case of L1 exchanges, since two different languages had to be used.

Research question and variables

This study focuses on the differences between the L1 and L2 configurations of OIE as far as their perceived contributions to the development of different 21st century competences are concerned. The differences between each configuration (L1 or L2) are analysed regarding the students' self-reported development of 21st century competences: digital literacy, teamwork, intercultural competences, linguistic competences, Language for Specific Purposes learning and learner autonomy.

Data gathering

Data were gathered by means of preintervention and postintervention questionnaires which were completed by the participants before and after the exchanges, as well as focus group interviews which were carried out with all participants, in discussion groups of 4 to 5 students. The questionnaires were divided into 60 open-ended and closed questions spread across five sections, A–E. The combination of quantitative data collected through 7-point Likert-scale responses (Winter & Dodou, 2010) and qualitative data from the responses to the open-ended questions aimed at determining the group differences in the perceptions of the L1 and L2 exchanges respectively. The results presented on this paper stem from the postintervention questionnaire. The focus group interviews were carried out by teaching assistants and the responses were later transcribed and analysed to explore the reasons behind different perceptions concerning the variables studied.

Section A comprised questions concerning demographic data as well as information about the students' use of the Internet and social media. The questions included in Sections B–D were closed. Students were asked to rate different statements according to their level of agreement or disagreement by using a 7-point Likert scale. Meanwhile, the questions from section E were open-ended and provided a prompt which students had to complete and, by doing so, they could express their opinions about specific aspects of the project. The topics and number of questions from each section are shown in the following table (Table 1).

As for the discussion topics of the focus group interviews, these were five main broad topics: experience with telecollaboration; issues and how they dealt with them; strategies to overcome communication difficulties; views on language learning, collaboration, culture, online interaction and technology in education after the exchange; degree of effectiveness of telecollaboration regarding the improvement of different skills; and their relationships within the learning community.

Analysis

A *t*-test to check differences in participants' perceptions regarding the two OIE configurations was conducted: Group 1 was made up of the participants on the Wofford-UV L1 OIE, whereas Group 2 was made up of the participants in the CUT-UV L2 OIE, which were named SCI-TEL and CSI-TEL.

Table 1: Questions from the prequestionnaires and postquestionnaires

Questions-from-the prequestionnaires and postquestionnaires		
Section	Topic	Question numbers
A	Demographic information	1–8
B	Foreign-Language-Learning	8–17
C	Telecollaboration	18–25
D	Intercultural Awareness and Communication	26–45
E	Overall language learning experience	46–60

Group	
Variables	Mean
DIG	5.04
TEAM	4.93
AUT	5.05
CULT	4.28
LEARN	5.61
LING	5.48

Results and disc

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Table 2: Mean score values and standard deviation for Groups 1 and 2

Variables	Group 1: L1 n = 47			Group 2: L2 n = 72				
	Mean	Standard deviation	Standard error	Mean	Standard deviation	Standard error	Skew	Kurtosis
DIG	5.04	1.19	0.17	4.75	0.76	0.09	-0.23	-0.19
TEAM	4.93	1.12	0.16	4.45	0.84	0.10	-0.17	-0.16
AUT	5.05	0.71	0.10	3.84	0.61	0.07	0.15	-0.88
CULT	4.28	1.73	0.25	5.37	1.57	0.18	-0.43	-0.40
LEARN	5.61	0.68	0.10	4.57	0.52	0.06	0.09	-0.73
LING	5.48	0.96	0.14	3.81	0.41	0.05	0.91	-0.28

Results and discussion

The descriptive statistics associated with the perceived learning gains in each kind of configura-
 tion are reported in Table 2 above. A further date breakdown is provided on Table 3, which
 shows the mean values of the four different subgroups. As can be observed, participation in L1
 OIE was associated with numerically higher perceptions of the development of five of the compe-
 tences under investigation, compared to the L2 configuration. Meanwhile, only one of the
 competences under investigation (intercultural competence) scored numerically higher in the L2
 than in the L1 OIE.

In order to find out which OIE configuration (L1 or L2) would have a significant effect on the
 21st century competences under investigation, a *t*-test was performed.

Before conducting the *t*-test, the assumption of normality was evaluated. As can be observed in
 Table 2, the distribution in the two groups was associated with skew and kurtosis values lower
 than |2.0| and |9.0| respectively (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). Also, the
 assumption of homogeneity of variances was tested based on Levene's *F* test. As shown in Table
 4, for three of the competences (digital literacy, teamwork and linguistic competence) the null
 hypothesis of no homogeneity cannot be rejected as the *F* value obtained is significant. Therefore,
 for the *t*-test no equal variances are assumed (Lizasoain & Joaristi, 2003).

The *t*-test provided a significant effect for five of the competences investigated, based on the exchange
 configuration. The only competence for which no significant differences were found was digital liter-
 acy (coded as DIG). Thus, the null hypothesis of no differences between the means was rejected, as
 significant differences exist between the participants' perceived learning gains in the two groups.

As displayed above, there were significant differences ($p \leq .05$) between each of the groups con-
 cerning teamwork (TEAM), intercultural competence (CULT), LSP learning (LEARN), learner
 autonomy (AUT) and linguistic competence (LING). The sharpest differences were found in lin-
 guistic competence.

Meanwhile, there were no significant differences ($p \geq .10$.) regarding the development of digital
 literacy, as shown in Table 4 above.

The results indicate that the OIE configuration followed (L1 or L2) did not only affect participants'
 perceptions regarding language learning (whether linguistic competences or specialised language
 learning). In fact, the mean scores were higher in group 1 than in group 2 in all but the digital
 and intercultural competences. One possible explanation for these differences might be the mis-
 matched levels of proficiency of the participants in the L2 exchange. The perceived negative effect
 of this could have negatively affected the perceptions of different variables in the L2 exchange:
 team work, autonomy, general linguistic learning and specific vocabulary learning. This imbalance
 seems to have increased the linguistic anxiety of the less proficient language users, while

Table 3: Mean score values and standard deviation for Subgroups 1.1, 1.2, 2.1 and 2.2

Variables	Group 1.1: Wofford n = 15			Group 1.2: UV n = 32			Group 2.1: CUT n = 50			Group 2.2: UV2 n = 28		
	Mean	Standard deviation	Standard error	Mean	Standard deviation	Standard error	Mean	Standard deviation	Standard error	Mean	Standard deviation	Standard error
DIG	4.61	0.90	0.23	5.24	1.26	0.22	4.78	0.75	0.11	4.68	0.78	0.15
TEAM	4.63	0.81	0.21	5.07	1.22	0.22	4.50	0.74	0.11	4.38	0.99	0.19
AUT	5.03	0.58	0.15	5.06	0.77	0.14	3.63	0.52	0.07	4.20	0.59	0.11
CULT	3.73	1.64	0.42	4.53	1.74	0.31	5.45	1.40	0.20	5.23	1.84	0.35
LEARN	5.63	0.50	0.13	5.59	0.76	0.13	4.41	0.49	0.07	4.85	0.45	0.09
LING	5.22	0.73	0.19	5.60	1.04	0.18	3.87	0.36	0.05	3.70	0.47	0.09

Table 4

Variables	T value
DIG	1
TEAM	2
AUT	10
CULT	-3
LEARN	9
LING	13

*Similar variance assumed
 †No similar variance

provoking feelings of...
 These negative consequences...
 questions as well as...
 Response 1, Cypriot female...
 did. (...) Because they...
 more comfortable, when...
 Response 2, Cypriot male...
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 we were concerned about...
 Response 3, Spanish...
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 Response 4, US female...
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Table 4: Differences between groups concerning the variables under investigation

Variables	T-test					
	T value*	gl	p Value	T value [†]	gl	p Value
DIG	1.7	123.0	0.1	1.5	68.7	0.1
TEAM	2.7	123.0	0.0	2.5	77.0	0.0
AUT	10.2	123.0	0.0	9.8	85.9	0.0
CULT	-3.6	123.0	0.0	-3.5	89.5	0.0
LEARN	9.6	123.0	0.0	9.0	77.8	0.0
LING	13.5	123.0	0.0	11.3	56.2	0.0

*Similar variance assumed.

[†]No similar variance assumed.

provoking feelings of frustration, impatience or lack of challenge on the more proficient peers. These negative consequences can be inferred from the students' responses in the open-ended questions as well as in the focus group discussions:

Response 1, Cypriot female student: Generally, they [the Spanish students] spoke a lot more than we did. (...) Because their level of English is higher, and because they are more used to talking. They are more comfortable, while we are kind of afraid of talking because we might say something wrong.

Response 2, Cypriot male student: It scared us because as we saw on the videos they made, comparing ourselves with the Spanish students, they said more things on the videos, they had more ideas. And we were concerned about this, I think.

Response 3, Spanish female student: The thing is they [the Cypriot students] didn't know mmm... much English (...) I think there was a group that did the exchange with students from Arizona (...) I think it is not the same if you're speaking with someone that actually speaks English than talking to someone who doesn't know much more English than you do.

Response 4, US female student: I got to ask a lot of questions to my partner in Spain, I got like honest feedback and stuff and that was really good because I was able to get like what they actually say and just learn the differences from what I'd learn (...) My relationship with my partners in the project definitely improved because we communicated a lot when it came to making the videos.

In spite of the fact that in the L1 configuration there was also a proficiency level mismatch, this does not seem to have affected the exchange. A possible explanation for this might be that in L1 exchanges the direction of the mismatch changes when the participants change language. This means that each participant has the experience of using a language at higher proficiency level than their partner (when using their native language). This kind of fixed imbalance in target language proficiency is likely to be common in L2 exchanges. The only way to resolve it would be for teachers to find groups with similar levels of L2 proficiency. Nevertheless, across national and L1 boundaries this is likely to be difficult, as countries often have different typical routes of development in the L2. This is, therefore, a potential challenge for L2 configurations generally.

With regard to the development of linguistic competences and LSP learning, the L1 configuration was perceived as more beneficial than the L2 configuration. The mean score values of linguistic competences were significantly higher in the L1 exchange or Group 1 than on the L2 exchange or Group 2. Seemingly, the mean score values of LSP learning were higher in Group 1 than in Group 2. The aforementioned responses concerning level mismatch might be a reason why overall students participating in the L2 exchange thought they had developed their linguistic competences and learnt LSP to a lesser extent than students participating in the L1 exchange.

Therefore, the students' responses indicate that the mismatch in the participants' level of proficiency affected how well they worked together in the L2 exchange, whereas this was not considered as an issue in the L1 exchange. As illustrated by the responses above, in the L2 exchange the lower English level of some of the Cypriot students (B1 on the CEFR) when compared to the level of the Spanish students (B2+ on the CEFR) was perceived as negatively affecting teamwork, especially with regard to oral output and contributions of ideas for group assignments. Meanwhile, the level mismatch was not perceived as negatively affecting teamwork in the case of the L1 exchange, where peer-teaching was very common among students from both Spain and the USA.

As for intercultural competence development, significant differences were found: the mean score values for intercultural competence were considerably higher in Group 2 than in Group 1. A possible explanation for the higher scores of the L2 exchange might be found in the way (inter)cultural aspects were analysed by participants. In these cases, Cypriot and Spanish students reported the similarities they found in both cultures had had a positive effect in their perceived intercultural competence development:

Response 5, Cypriot Male student: We just learned that... We talked to these guys [Spanish students], they are no different from us. They are like us, they have the same concerns, the same hobbies more or less, we have some minor differences, so to speak, they grew up in Spain, we grew up in Cyprus, it's only natural to have some differences or habits, etc. Generally speaking, we are all humans, we are no different. And perhaps all these about ethnicities are in fact stereotypes in order to separate people to the advantage of some others, not to our advantage whatsoever.

Response 6, Cypriot male student: They were like us (...) Spanish people have the same problems as we do, financial, social (...).

Response 7, Spanish male student: It was pretty similar to our culture. They obviously had several differences but it was pretty similar, like in Spain the culture is almost the same. So we had many things in common.

However, the responses obtained from US and Spanish students in the focus group discussions and in the open-ended questions indicate that they too found the L1 configuration of their exchange beneficial for intercultural competence development. This reflection illustrates that positive perception:

Response 8, American male student: I got to learn first-hand about how Spain works. And in school they never taught us about Spain, we usually in America only focus in American history, and if we do world history it is about like pre-historical history. And I wanted to learn like how Spain works today, how do the universities work in Spain? How are the relationships with professors different? How are social dynamics different? So that was something I got to learn straight from the people who experience it, which I think is super cool because most of the time you're going to have to go on with something that's in a book and that's, you know, it's not the same.

Therefore, it cannot be concluded that it is the L2 configuration itself which resulted in higher perceived intercultural development, since it could appear that lower perceived background knowledge of the other culture (eg, Spanish students presumably initially feeling they knew more about the US than they knew about Cyprus) or higher similarity between the cultures could also be factors leading to the higher perceived intercultural development in Group 2. In other words, these two factors are not necessarily related to the L2 OIE configuration.

Finally, no significant differences were observed in the case of digital literacy, even though the mean was slightly higher in Group 1 than in Group 2. This indicates that the choice of OIE configuration (L1 or L2) had no effect on students' perceptions of the development of their digital literacy. Their responses and comments in the open-ended questions as well as in the focus group discussions seem to corroborate this:

Response 9, Spanish male student: Our digital skills have improved. We had to do so many technological things, this project implied lots of technological activities.

Response 10, Cypriot female student: Technology has developed a lot, and this was kind of confidence building.

Response 11, US female student: It was a good experience.

Conclusions

This study aimed to explore how perceived development of intercultural competence was perceived as a result of the exchange configuration: teamwork or individual work. Furthermore, no significant differences were found.

There were significant differences in linguistic competence and intercultural competence. The kind of language exchange towards choosing a language and expectations or LSP learning, exchanges with a native speaker, always possible, exchange might be different in languages. Moreover, proficiency in the language was not a significant factor.

Regarding proficiency in the language, the learner to work with a native speaker take place in a context (Dooly & Sadler, 2013). The expert role in the context of proximal development and learning can be supported (Dooly & Sadler, 2013). Moreover, working together, the expert role in the context of proximal development and learning can be supported (Dooly & Sadler, 2013; L2 configuration, it was not a significant factor.

There were no significant differences in digital literacy. However, significant differences in teamwork and digital literacy are found. This aspect

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Response 10, Cypriot female student: Basically, I think that all aspects have been developed but technology has developed the most. We learned Google Drive (...) We used hangouts. At the beginning it was kind of confusing until we coordinated our meetings, until we synchronized the times.

Response 11, US male students: My digital skills are about the same, I've been using software like this before.

Conclusions

This study aimed at exploring the differences between an L1 and an L2 OIE with regard to the perceived development of 21st century competences. The results indicate that the L1 exchange was perceived as more beneficial than the L2 exchange for four of the six variables under investigation: teamwork, LSP learning, learner autonomy and linguistic competence. However, the L2 exchange was considered more beneficial for the development of intercultural competence. Furthermore, no significant differences were found between the two groups regarding digital literacy.

There were significant differences regarding the participants' perceptions of the development of linguistic competences and LSP learning. The implications of this are that before choosing the kind of language exchange configuration the goals of the OIE should be made explicit with a view towards choosing a configuration that is suited to the students' needs, characteristics, interests and expectations. In the case of exchanges aimed at fostering linguistic competence development or LSP learning, the results of the study indicate that an L1 exchange is more suitable in exchanges with similar characteristics to the ones described in this paper. However, this is not always possible as, depending on the target language, finding a foreign partner for an L1 exchange might prove extremely difficult, especially in the case of less frequently taught languages. Moreover, in the case of L2 exchanges, finding two classes with the exact same level of proficiency in the target language is equally difficult.

Regarding proficiency level mismatch, it should be borne in mind that it might be beneficial for a learner to work with someone of a higher level. This means that a successful L2 exchange can take place in a context where there is a language mismatch between the group or dyad members (Dooly & Sadler, 2013). In this context, the more proficient or more capable peer would assume the expert role in the peer-learning relationship. This has been connected to the concept of zone of proximal development (ZPD) (Vygotsky, 1978), according to which a problem can be solved and learning can be fostered through collaboration with more capable peers (Dooly & Sadler, 2013). Moreover, it could be argued that both the more and the less capable peers learn when working together, and a wider interpretation of the ZPD considers that it works both ways (Dooly & Sadler, 2013; Lantolf & Thorne, 2006). It should be noted, though, that a level mismatch was also present in the L1 exchange, but with the particularity that the direction of the mismatch changed when participants changed language. This means that each participant has experience of using a language at higher proficiency than their partner throughout. Therefore, switching the language spoken meant for L1 OIE participants to alternatively assume the roles of language coach, when speaking their native language and, therefore, being the more capable peer or language expert (Dooly & Sadler, 2013), guiding and helping their peers; and less capable peers or language "coachees," when receiving the help and support from their NS peers. The implication of this is that there is not necessarily a greater scope for this kind of positive "ZPD effect" in the L2 configuration, since proficiency levels mismatches are also present in the L1 configuration.

There were no significant differences regarding the perceptions of the development of digital literacy. However, significant differences were found in teamwork, autonomy and intercultural competence, the score of the L1 exchange being higher than those of the L2 exchange for both teamwork and autonomy and lower for intercultural competence. The implications regarding digital literacy are that when choosing the type of exchange this factor should not affect the decision, as this aspect is not affected by the exchange configuration. In other words, both L1 and L2

can contribute to developing students' digital literacy. In the case of teamwork and intercultural competence, as reported earlier, significant differences were found. A possible way to avoid the perceived negative impact on teamwork of the different levels of language production (based on the students' respective levels of proficiency) is to set specific durations of the interventions of each speaker. This can be done either in time or in length of the interactions, so as to guarantee that the output of both speakers from each dyad is similar.

This study has several limitations. The first limitation has to do with the fact that it compares two samples from different groups of participants and, therefore, we should be cautious about generalising the results to the entire population. Seemingly, the lack of a control group makes it difficult to eliminate and isolate variables. The second limitation is that the L2 group students could have had twice as much time to use the target language in the synchronous exchanges, compared to the L1 group. Thus, the L2 group could have had twice as much opportunity to use and practice the target language, which in turn could have influenced the difference in perceptions regarding the two configurations. In addition, as mentioned earlier, the complexity of the exchanges implied that a wide number of variables were beyond the control of researchers (eg, reciprocity, communication breakdowns and intercultural communication issues). Another limitation is that no performance test was carried out to see whether the students' level of performance matched their perceptions regarding the development of the skills and competences under investigation. To address these issues and overcome the aforementioned limitations, future studies could be carried out with the same group of students participating in an L1 exchange and also in an L2 exchange, with a bigger sample and adding a control group, so as to enable same-sample comparisons while increasing generalisability and reliability.

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Statements on open data, ethics and conflict of interest

The data of the study can be accessed by emailing the corresponding author. Ethical clearance was sought through institutional channels. Research participants gave informed consent and data has been anonymised. There was no conflict of interest in the conduct of this research.

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Appendix 1

Postquestionnaire on telecollaboration

Dear student,

The present questionnaire is anonymous. The data will be used only for the purposes of research and treated as strictly confidential. Your participation is voluntary, and the questionnaire should only take 10-15 minutes to complete. Thank you in advance.

* Required

SECTION A -DEMOGRAPHICS

Tick as appropriate

1. i. Nationality *

Mark only one oval.

- Spain
- United States
- Cyprus
- Finland
- Canada
- Other: _____

2. ii. Gender *

Mark only one oval.

- Male
- Female
- Other: _____

3. iii. Date of birth *

Please write the MONTH first and then the DAY. Don't forget to include the YEAR too

Example: December 15, 2012

4. iv. Age *

Mark only one oval.

- 17-20
- 21-24
- +25
- Other: _____

5. v. University where

- Universitat c
- Wofford Coll
- Cyprus Univ
- Aalto Univer
- Dalhousie U
- Northern Ari
- Other: _____

6. vi. Project you are p

- Wofford-UV
- SCI-TEL CUT
- Aalto-UV
- CSI-TEL CU
- NAU-UV
- Other: _____

7. vii. Level of English

Please state your cur
(Spanish)

- A1 - Beginner
- A2 - Upper Be
- B1 - intermedi
- B2 - Upper-int
- C1 - Advance
- C2 - Advance

8. viii. Current Degree *

- International B
- Business Mana
- Economics
- Hotel and Touri
- Other: _____

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ney-Wilcoxon. *Practi-*

5. v. University where you are currently studying *

- Universitat de Valencia
- Wofford College
- Cyprus University of Technology
- Aalto University
- Dalhousie University
- Northern Arizona University
- Other: _____

6. vi. Project you are participating in *

- Wofford-UV
- SCI-TEL CUT-VLC
- Aalto-UV
- CSI-TEL CUT-UV _____
- NAU-UV
- Other: _____

7. vii. Level of English / Spanish *

Please state your current level in the language you are learning within the project (English or Spanish)

- A1 - Beginner
- A2 - Upper Beginner
- B1 - Intermediate
- B2 - Upper-intermediate
- C1 - Advanced
- C2 - Advanced +

8. viii. Current Degree *

- International Business
- Business Management
- Economics
- Hotel and Tourism Management
- Other: _____

9. ix. Social networks *

Please select the social networks you have a profile on:
Check all/ that apply.

- Facebook
- Twitter
- YouTube
- Google+
- Second Life
- Oovoo
- Skype
- Instagram
- Snapchat
- Other: _____

10. x. Time spent on the Internet weekly *

How many hours do you spend on the Internet overall per week?

- 1-2
- 3-5
- 6-9
- 10-20
- 21-40
- 41-50
- 51+

SECTION B - OVERALL OPINION ABOUT TELECOLLABORATION

Rate from 1 (=not at all) to 7 (= very much)

11. B1. This project has been motivating for me *

- 1 2 3 4 5 6 7
- Not at all Very much

12. B2. This project has helped me improve my overall level of English/Spanish *

- 1 2 3 4 5 6 7
- Not at all Very much

13. B3. This project field of study*
Mark only one

- 1
- Not at all

14. B4. This project

- 1
- Not at all

15. B5. I have enjoyed

- 1
- Not at all

16. B6. At least one m

- Yes
- No

17. B7. At least one me

- Yes
- No

18. B8. Would you consider yourself an entrepreneur? Why?

19. B9. This project has

- 1
- Not at all.

20. B10. This project has

- 1
- Not at all.

13. B3. This project has helped me improve my level of English/Spanish from my specific field of study*

Mark only one oval.

	1	2	3	4	5	6	7	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very much

14. B4. This project has made me feel anxious *

	1	2	3	4	5	6	7	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very much

15. B5. I have enjoyed this project more than doing traditional activities *

	1	2	3	4	5	6	7	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very much

16. B6. At least one member of my family is an entrepreneur *

Yes
 No

17. B7. At least one member of my family is a small business owner *

Yes
 No

18. B8. Would you consider becoming an entrepreneur? Why/Why not? *

19. B9. This project has helped me improve my ICT (digital) skills *

	1	2	3	4	5	6	7	
Not at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very much.

20. B10. This project has brought me closer to other cultures *

	1	2	3	4	5	6	7	
Not at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very much.

21. **B11. This project has made me feel part of a learners' community ***

Mark only one oval.

1 2 3 4 5 6 7
 Not at all. Very much.

22. **B12. This project has helped me improve my intercultural communication skills ***

1 2 3 4 5 6 7
 Not at all. Very much.

23. **B13. This project was a good way to meet new people ***

1 2 3 4 5 6 7
 Not at all. Very much.

24. **B14. This project was a good opportunity to experience online interaction ***

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

25. **B15. This project has helped me become a more autonomous learner ***

1 2 3 4 5 6 7
 Not at all. Verymuch.

SECTION C - LANGUAGE LEARNING

Rate from 1 (=not at all) to 7 (=very much)

26. **C1. I'm motivated to learn English/Spanish at the University ***

Rate from 1 (= not at all) to 7 (= very much)

1 2 3 4 5 6 7
 Not at all. Very much.

27. **C2. I feel comfortable using technology in my English/Spanish classes ***

1 2 3 4 5 6 7
 Not at all. Very much.

28. **C3. This project ha ***

1
 Not at all.

29. **C4. This project ha**

1
 Not at all.

30. **C5. I enjoy working**

1
 Not at all.

31. **C6. This project has**

1
 Not at all.

32. **C7. This project has**

1
 Not at all.

33. **CS. I would like to w**

1
 Not at all.

34. **C9. I would like to w telecollaboration ***

1
 Not at all.

28. C3. This project has helped me acquire specific vocabulary from my field of specialisation *

1 2 3 4 5 6 7
Not at all. Very much.

29. C4. This project has helped me develop my skills in English/Spanish*

1 2 3 4 5 6 7
Not at all. Very much.

30. C5. 1 enjoy working with other students in my language classes *

1 2 3 4 5 6 7
Not at all. Very much.

31. C6. This project has helped me learn general English/Spanish *

1 2 3 4 5 6 7
Not at all. Very much.

32. C7. This project has helped me learn specific English/Spanish *

1 2 3 4 5 6 7
Not at all. Very much.

33. CS. 1 would like to work again with students from abroad in my language classes *

1 2 3 4 5 6 7
Not at all. Very much.

34. C9. 1 would like to work again with students from abroad in my language classes through telecollaboration*

1 2 3 4 5 6 7
Not at all. Very much.

35. C10. 1 prefer working by yourself in my language classes *

Mark only one oval.

1 2 3 4 5 6 7
 Not at all. Very much.

SECTION D - (INTER)CULTURAL AWARENESS

Tick as appropriate, from 1 (=completely disagree) to 7 (= completely agree)

36. D1. 1 think that all cultures have something to offer the world *

Mark only one oval.

1 2 3 4 5 6 7
 Completely disagree. Completely agree.

37. D2. When I notice cultural differences, my culture seems to have the best approach *

1 2 3 4 5 6 7
 Completely disagree. Completely agree.

38. D3. 1 think that my culture is the only right one *

1 2 3 4 5 6 7
 Completely disagree. Completely agree.

39. D4. Some people have a culture and others do not *

1 2 3 4 5 6 7
 Completely disagree. Completely agree.

40. D5. 1 am aware of my own cultural biases and how they affect my thinking *

1 2 3 4 5 6 7
 Completely disagree. Completely agree.

41. D6. 1 feel uncomfo

Mark only one oval.

Completely disagree

42. D7. 1 speak up if I v

Completely disagree.

43. D8. 1 appreciate the i

Completely disagree.

44. D9. 1 try to learn abo

Completely disagree.

45. D10. 1 have many frier

Completely disagree.

46. D11. Most of my friend

Completely disagree.

47. D12. I'm interested in i

Completely disagree.

41. **D6. 1 feel uncomfortable when others make racially offensive comments or jokes ***
Mark only one oval.

	1	2	3	4	5	6	7	
Completely disagree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely agree.

42. **D7. 1 speak up if I witness another person being humiliated or discriminated against ***

	1	2	3	4	5	6	7	
Completely disagree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely agree.

43. **D8. 1 appreciate the richness of other cultures ***

	1	2	3	4	5	6	7	
Completely disagree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely agree.

44. **D9. 1 try to learn about other cultures***

	1	2	3	4	5	6	7	
Completely disagree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely agree.

45. **D10. 1 have many friends from a variety of ethnicities ***

	1	2	3	4	5	6	7	
Completely disagree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely agree.

46. **D11. Most of my friends are from my own ethnic background***

	1	2	3	4	5	6	7	
Completely disagree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely agree.

47. **D12. I'm interested in the ideas and beliefs of people from different ethnicities ***

	1	2	3	4	5	6	7	
Completely disagree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Completely agree.

48. D13. I connect easily with people from different ethnicities and am able to communicate easily *

1 2 3 4 5 6 7

Completely disagree. Completely agree.

49. D14. I only feel comfortable with people of my culture *

1 2 3 4 5 6 7

Completely disagree. Completely agree.

50. D15. I intentionally involve people from many cultural backgrounds in my life *

1 2 3 4 5 6 7

Completely disagree. Completely agree.

51. D16. It's really hard for me to feel close to a person of another ethnicity *

1 2 3 4 5 6 7

Completely disagree. Completely agree.

52. D17. I frequently interact with people from a different country from my own *

1 2 3 4 5 6 7

Completely disagree. Completely agree.

53. D18. I attend events where I might get to know people from different ethnic backgrounds *

1 2 3 4 5 6 7

Completely disagree. Completely agree.

54. D19. If I could design my own world, I would choose elements from my own culture only *

1 2 3 4 5 6 7

Completely disagree. Completely agree.

55. D20. Getting to know me *

Completely disagree

SECTION E - LEARNING SETTING

Describe your experience

56. E1. What opportunities in a diverse setting? *

57. E2. What are the most common languages spoken at home? English/Spanish at home

58. E3. What are the most common languages spoken at work? English/Spanish at work

59. E4. How would you describe your experience? Use your own words.

55. D20. Getting to know someone of another culture is generally an exciting experience for me *

1 2 3 4 5 6 7

Completely disagree. Completely agree.

SECTION E - LEARNING LANGUAGES IN A MULTICULTURAL SETTING

Describe your experience.

56. E1. What opportunities have you had studying English/Spanish in a multicultural and diverse setting? *

57. E2. What are the most beneficial aspects of a diverse, multicultural setting for learning English/Spanish at university level? *

58. E3. What are the most challenging aspects of a diverse, multicultural setting for learning English/Spanish at university level? *

59. E4. How would you define "intercultural communication"? *

Use your own words.

60. E5. Which telecollaboration activity did you find most useful? Tick as many boxes as you want.*

Check all that apply.

- Digital profile and introductory video.
- Google+ hangouts.
- Games (Kahoot!, blubbr).
- Google+ posts and comments.
- Ted Talk videos.
- Problem-solving scenarios.
- Digital stories.
- Oral presentations.
- Assessment and voting.
- Other: _____

61. E6. In 1 minute, write as many things as you can about your telecollaboration partners' country and culture*

62. E7. How did you learn those things? Tick as many boxes as you want*

Check all that apply.

- Your foreign partners told you.
- Through the Kahoot! game.
- You googled the information out of curiosity.
- Through the telecollaboration tasks.
- You teacher taught you.
- You learned them when visiting your partners' country.
- Other: _____

63. E8. My telecollaborat*

Tick as many boxes as
Check all that apply.

- fun.
- boring.
- useful.
- frustrating.
- tiring.
- interesting.
- challenging.
- motivating.
- stressful.
- enjoyable.
- Other: _____

64. E9. Which digital too

Tick as many boxes as
Check all that apply.

- Google+ Comm
- Google+ hango
- Google docs.
- Google slides.
- Skype.
- Facebook.
- Email.
- YouTube.
- Twitter.
- Moodle / a Virtu
- Moviemaker.
- iMovie.
- Photoshop.
- PowerPoint.
- Prezi.
- Other: _____

63. ES. My telecollaboration experience this semester was ... (tick as many boxes as you want)

*

Tick as many boxes as you want.
Check all that apply.

- fun.
- boring.
- useful.
- frustrating.
- tiring.
- interesting.
- challenging.
- motivating.
- stressful.
- enjoyable.
- Other: _____

64. E9. Which digital tools have you used for the telecollaboration activities? *

Tick as many boxes as you want.
Check all that apply.

- Google+ Communities.
- Google+ hangouts.
- Google docs.
- Google slides.
- Skype.
- Facebook.
- Email.
- YouTube.
- Twitter.
- Moodle / a Virtual Learning Environment.
- Moviemaker.
- iMovie.
- Photoshop.
- PowerPoint.
- Prezi.
- Other: _____

65. E10. Telecollaboration has helped me develop my ... *

Tick as many boxes as you want.
Check all that apply.

- general vocabulary
- specific vocabulary
- speaking skills
- listening skills
- reading skills
- writing skills
- ICT (digital) skills
- creativity
- critical thinking skills
- research skills
- organisation skills
- problem-solving skills
- decision-making skills
- team-working skills
- autonomy
- Other:

66. E11. In my opinion, the Google+ Community was ... *

67. E12. Google Drive was ... ***68. E13. Something I LIKED about the project was ... ***

69. E14. Something I DID NOT LIKE about the project was ... ***70. E15. My overall opinion about the project is ***

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Google Forms

Appendix 2**Telecollaboration**

1. Describe your ex
lish/Spanish cou
2. What issues hav
What has gone
learned and wha
3. When interactin
was effective? Ho
students?
4. Has your partici
you view:
 - a. Language lear
 - b. Collaboration?
 - c. Culture?
 - d. Online interac
 - e. Technology in
5. Has your particip
 - a. Your language
 - b. Your digital (te
 - c. Your relationsl
 - d. Your relationsl
6. Is there anything
duration).

Appendix 2

Telecollaboration project: Focus groups questions

1. Describe your experience with telecollaboration with foreign students as part of your English/Spanish course at the University.
2. What issues have arisen from your work with foreign students through telecollaboration? What has gone smoothly and what has been challenging in this work? What have you learned and what has been the greatest difficulty?
3. When interacting with the foreign students, how did you ensure that communication was effective? How did you overcome problems/difficulties in working with distant foreign students?
4. Has your participation in the telecollaboration activities changed significantly the way you view:
 - a. Language learning?
 - b. Collaboration?
 - c. Culture?
 - d. Online interaction?
 - e. Technology in education?
5. Has your participation in the telecollaboration activities been effective in developing:
 - a. Your language skills?
 - b. Your digital (technology) skills?
 - c. Your relationship with your fellow students?
 - d. Your relationship with your teacher?
6. Is there anything you would add/change in this project? (tasks, digital tools, time spent, duration).

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