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5. Impact of Virtual Exchange on teachers' and student teachers' sense of isolation

Introduction

Professional isolation caused by lack of networking and collaboration opportunities with other colleagues and experts is regarded as one of the main challenges to sustaining teachers' motivation and enriching their professional experience (Echazarra & Radinger, 2019; OECD, 2016). One of the aims of the VALIANT project was to identify whether Virtual Innovation and Support Networks as an approach would contribute to overcoming teachers' and student teachers' sense of isolation and low motivation in rural areas and other isolated contexts while promoting teachers' and student teachers' effectiveness in online international networks of professional collaboration. Drawing from data gathered from the 24 Virtual Exchanges (VEs) carried out in the VALIANT project, this chapter will present the coding framework, results of the quantitative and qualitative data analysis, and key findings regarding the impact of VE on teachers' and student teachers' self-perceived sense of isolation.

Defining and Researching Isolation

Teacher professional isolation has been referred to as

> *a state when a professional individual experiences a sense of isolation from his/ her professional peers, while lacking mentoring and opportunities for professional*

interaction, collaboration and development and is a multidimensional concept which may be either geographic, social, and/or ideological (Kutoane et al., 2021, p. 1).

However, there is still no universally accepted definition of professional isolation, and many categories vary and may partly overlap. Teacher isolation is a crucial issue because it can negatively affect teachers' professional development and job satisfaction (Ostovar-Nameghi & Sheikhahmadi, 2016). It can contribute to burnout and affect teachers' sense of self-efficacy, which can subsequently precipitate teachers leaving the workforce (Heider, 2005; Johnson et al., 2014). Teacher attrition is a significant challenge in education in many countries, and feelings of isolation have been identified as the primary contributor (Heider, 2005). Furthermore, teacher retention in public schools in economically disadvantaged, and in particular rural areas, has been shown to adversely impact students' outcomes (Boyd et al., 2005). Teacher isolation can directly or indirectly contribute to students' poor academic performance since teachers' professional development is derailed, and teachers become unsatisfied with their jobs and may perform below their potential (Padwa et al., 2019).

The most popular interventions for addressing teachers' professional isolation involve teacher collaboration, such as professional learning communities (Hoaglund et al., 2014), mentoring (Çankaya et al., 2009), collaborative planning (often carried out alongside professional learning communities and mentoring practices; Kilpatrick & Fraser, 2019), and teacher teams (Johnson et al., 2018). Collaborative planning and teacher teams can also reduce teachers' professional isolation, but they are less known than professional learning communities and mentoring (Nolan et al., 2013). There are also collaborative interventions that have been designed in a hybrid manner, integrating the various approaches above (Knight, 2020). A specific example of such a project is the VALIANT project, aimed at bringing together teachers, student teachers, and experts in a facilitated online collaboration.

Methodology

The current study seeks to shine a light on teachers' and student teachers' perception of isolation and explore in what ways their involvement in

these VEs impacted their self-perceived sense of isolation by addressing the following research questions:

- RQ1: To what extent, if any, have the VALIANT VEs impacted teachers' and student teachers' perceived professional isolation?
- RQ2: How did engagement in VALIANT VEs contribute to teachers' and student teachers' opportunities for building supportive professional communities/connections?

RQ1 and RQ2 were addressed within the overall VALIANT research framework that collected quantitative survey data as well as qualitative, open-ended questions from teachers and student teachers using pre-, mid-, and post-VE surveys. Professional isolation was measured for teachers in the context of work and for student teachers in the context of studying and teaching placement. To examine RQ1, the participants' self-perceived isolation was measured holistically using an isolation scale and is thus referred to as *isolation scale* in the rest of the chapter. A second quantitative instrument was developed to measure the gains addressed in RQ2, referred to as the *VE Impact on Isolation survey*. For more information about the isolation scale and data collection and analysis, see Chap. 3 of this volume.

To answer RQ1 and RQ2, collected qualitative data were also examined and the findings were triangulated with the quantitative results. The triangulation provided a more in-depth understanding of how professional isolation was perceived by the participants in general and how they viewed the impact of the VE. The qualitative analysis followed a deductive and inductive approach which will be detailed in a later section.

Main Quantitative Findings

RQ1: Perceived Impact of VE on Overall Levels of Isolation

Firstly, the results overall showed that participants scored quite low in their initial levels of isolation (Round 1 $Md_{\text{pre-VE survey}}$ = 33.1; Round 2 $Md_{\text{pre-VE survey}}$ = 32.5, Round 3 $Md_{\text{pre-VE survey}}$ = 35.5). Most teachers who took part in the VE did not feel professionally isolated or even somewhat

isolated in their work (66.7 %). The same was observed for student teachers who did not perceive feeling isolated during their studies or placement (78 %).

To answer RQ1, data produced by both student teachers and teachers were analysed separately based on their self-reported levels of isolation. Due to the difference in group sizes between participants who reported not feeling professionally isolated and those who reported feeling somewhat isolated (the group who reported feeling at least somewhat isolated was substantially smaller), a statistical comparison was not made. The descriptive statistics however showed that the teachers who did not answer that they were feeling professionally isolated scored lower on the isolation survey ($Md_{pre\text{-}VE\ survey}$ = 30.1; $Md_{post\text{-}VE\ survey}$ = 29.7) than those who answered that they were feeling at least somewhat isolated ($Md_{pre\text{-}VE\ survey}$ = 42.1; $Md_{post\text{-}VE\ survey}$ = 41). A similar pattern was also observed for student teachers (not professionally isolated: $Md_{pre\text{-}VE\ survey}$ = 30.5, $Md_{post\text{-}VE\ survey}$ = 34.2; at least somewhat isolated: $Md_{pre\text{-}VE\ survey}$ = 43.2, $Md_{post\text{-}VE\ survey}$ = 41.2).

The descriptive statistics showed that although there was about 10 points difference in self-reported levels of isolation between the two groups, teachers showed little change in their perceived professional isolation in the workplace as a result of taking part in a VALIANT VE. It is important to note that, contrary to what was expected, the survey results showed that there was a moderate increase in the feeling of professional isolation in the sample of student teachers doing placements who did not answer that they were feeling isolated (Wilcoxon Signed Rank test z = -6.927, $p < 0.001$, r = -47).

There are a number of potential explanations for this perceived lack of impact of the VE on the levels of self-perceived professional isolation as measured by the isolation scale. If teachers or student teachers on placements indicated feeling administratively isolated, there is little that the VE could do to change the conditions of their actual workplace. Similarly, the VE could not alleviate feelings of emotional isolation brought on by the extreme conditions of online teaching and learning during the COVID-19 pandemic. On the other hand, taking part in the VE may have caused some of participants to reflect on their current situations and may have made them recognise that they do actually feel emotionally isolated, contributing to the moderate rise in sense of isolation amongst the student teachers. Also, the VE may not have met their expectations of mentorship or teamwork.

RQ2: VE Impact and Building Supportive Professional Communities for Teachers and Student Teachers

Overall, the VE experience was seen as highly positive by both teachers and student teachers. However, there were some important differences. The results consistently showed that teachers scored significantly higher across most of the items than the student teachers (see Figure 5.1). Teachers reported a significantly higher positive impact of VE on their sense of belonging and support. In addition, they also reported more reduction in feelings of isolation than student teachers did. Interestingly, teachers rated the highest impact of VE on the opportunity for professional development (Q3) whereas student teachers' highest rating was for making them feel more connected with others (Q2). These findings highlight that VE is a valuable intervention for teachers since it enhances their opportunities for professional development, and through VE collaboration, they can develop their professional skills and competencies. For student teachers, the VEs' main benefit was in forming friendships and connections i.e., building community. Thus, VE benefitted participants at different stages of their careers in diverse ways.
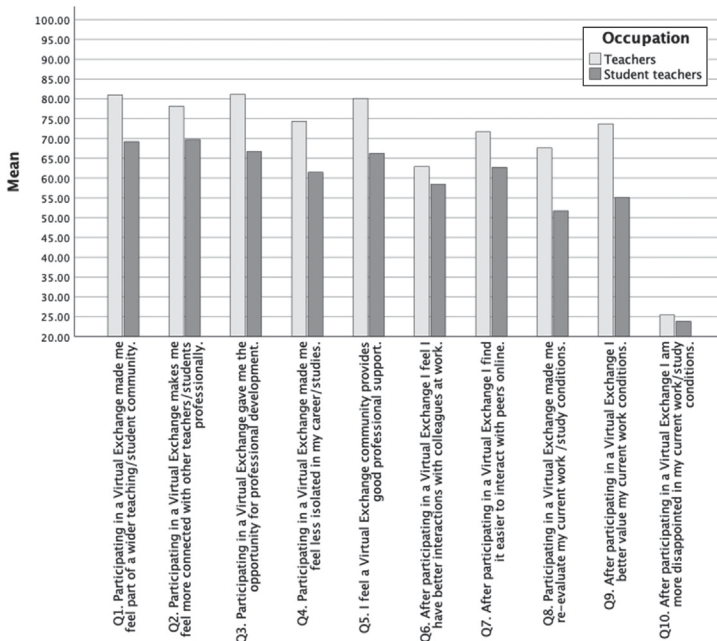
Figure 5.1: Descriptive statistics and t-test results for teachers' and student teachers'
            ratings of VE impact

*Statistics Q1) t=3.15, p<0.001, d= 0.5; Q2) t= 1.94, p=0.03, d=0.34; Q3) t=4.001,
p<0.001, d=0.63; Q4) t=2.88, p<0.001, d=0.46; Q5) t=3.38, p<0.001, d=0.59; Q6)
t=0.9, p=0.18, d=0.16; Q7) t=1.83, p=0.03, d=0.32; Q8) t=3.03, p<0.001, d=0.53; Q9)
t=3.82, p<0.001, d=0.66; Q10) t=0.35, p=0.36, d=0.06; df in all the t-tests =144.*

To further explore the impact of VALIANT VEs it was important to
look at the impact ratings separately for participants who had answered
in the pre-VE survey that they were feeling at least somewhat profes-
sionally isolated and those who did not. In the case of teachers, their
professional context where they could have felt isolated was work. In the
case of student teachers, there were two professional contexts, i.e., study
and placement. Some student teachers only studied at the university and
their professional context was studying, whereas other student teach-
ers were studying but either currently or previously also had placement
experience and therefore they had two professional contexts (study and
placement). The descriptive statistics for these three contexts are pre-
sented in Table 5.1.

Table 5.1. Descriptive statistics for teachers, student teachers in studying, and student teachers in placement on their overall self-reported scores for VE Impact on Isolation survey.

Self-identified as isolated	No			Somewhat/Yes		
	N	M	SD	N	M	SD
Teachers(work)	37	73.02	17.57	14	76.96	12.02
Student teachers (studying)	80	65.34	17.87	15	53.19	23.29
Student teachers (placement)	57	64.42	17.8	13	52.69	24.17

As can be seen from the table, teachers who had answered that they were feeling professionally isolated rated the impact of the VE consistently higher than those who did not feel professionally isolated. However, for student teachers the results were the opposite regardless of the context of isolation. Student teachers who had answered that they were feeling at least somewhat isolated rated the impact of the VE consistently lower than those who did not. It is not clear why this pattern was observed and to gain a better understanding of these results, responses to the open-ended-questions were examined.

To sum up, although the quantitative pre-and post-VE surveys in the first two rounds of VEs showed largely no change in the participants' feelings of professional isolation, the results of the VE Impact on Isolation survey (third round) analysis showed that participants found it useful for enhancing their feeling of community and relatedness. Importantly, the VE experience was highly valued by the teachers who self-identified as feeling isolated. They scored the highest for the statement that VE aided their professional development. However, regarding the student teachers, those feeling professionally isolated while studying scored the lowest for the impact of the VE on isolation.

To better understand the impact of the VE on isolation it is important to triangulate these quantitative findings with answers to the open-ended survey questions. The open-ended questions in the pre-VE survey were the following: "Would you describe your teaching/placement experience as working in isolation in some way?" In the mid-term survey the questions asked were: "Do you feel the exchange is helping you to feel less isolated professionally or to develop your professional network in any way? If possible, give a concrete example."

Framework for Qualitative Analysis: Codebook

The qualitative analysis was completed using essentially a thematic analysis approach (Braun & Clarke, 2006) but incorporated both a deductive and an inductive approach, starting with a conceptual framework based on an extensive literature review to which specific categories were added as they emerged in the initial round of categorisation. This allowed for identification of the most relevant categories, including subcodes for different types of professional isolation, namely geographic, spatial and physical (Ballantyne & Zhukov, 2017; Burton et al., 2013), emotional (Rogers & Babinski, 2002), and administrative (Tsang, 2018). Table 5.2 presents the codebook outlining the codes, subcodes, definitions, examples and frequencies.

Table 5.2. Codebook for qualitative analysis of self-perceived isolation

CODE	SUB-CODE	DEFINITION	EXAMPLE	FREQUENCY
Geographic, spatial and physical isolation	Relativising geographic separation	This code includes statements in which participants reported new perspectives on geographic/spatial separation.	The exchange certainly helps me feel less isolated professionally since it seems that my fellow teachers and future teachers across Europe have had similar troubles and worries as me. The exchange might also help me to connect with them in the future.	98
	Physical separation from familiar surroundings and family	This code includes statements in which participants reported how they are separated from familiar surroundings (e.g., being unfamiliar with school settings, the building, the classroom or even the city) and from family.	Going to school is different now. School used to be my second home. Now I go, have classes and return home. Teachers and students don't spend "leisure" time there.	12
	Disadvantages of remote teaching and learning	This code includes statements in which participants reported that working/studying online remotely had disadvantages, e.g., not being able to do group work effectively, not being able to visit teachers in their office.	This was in the form of online teaching for a small group so in that virtual environment I feel isolated.	109
	Advantages of remote teaching and learning	This code includes statements in which participants reported that working/studying online remotely had advantages, e.g., easier access to content or less time spent travelling to work/study.	We were able to talk about our classes and share possible ways of interacting with our students. Despite the distance, the internet brought us so near and we could reach each other anytime we set to meet: The interaction was set.	28

Table 5.2.   Continued

CODE	SUB-CODE	DEFINITION	EXAMPLE	FREQUENCY
	Experiencing spatial separation negatively	This code includes statements in which participants reported they are physically separated from others at school, such as in different buildings, in small schools where there is only one or only a few teachers per subject, or the case of itinerant/mobility teachers that find no opportunity to interact physically with other teachers.	I work with students with special needs and I'm the only teacher of the language and social area for this type of students in this high school.	120
	Experiencing spatial separation positively	This code includes statements in which participants reported they chose to work isolated because they can work better and more effectively alone and it enhances individual autonomy.	For sure, pandemic has made me look at the teaching process from a new, more modern point of view. We live in the era of technology where the internet gives us access to thousands of useful websites and interactive materials which may make our lessons even more engaging and motivating for students than ever before.	14
	Lack of technology	This code includes statements in which participants reported lack of technology or poor technological connectivity prevented communication with others or learning, thus reinforcing the sense of being physically apart.	We didn't have wifi for example. Moreover, we also did not have enough resources for every student/teacher (e.g., books, posters, computers).	48

Emotional isolation	Positive collegial interaction	This code includes statements in which participants reported they shared experiences, materials and tools; had the possibility of networking and collaborating with others, as well as participating in an (emergent) community of practice or learning.	The project definitely helps me to feel less isolated as a teacher. It is very enriching to exchange experiences with teachers from different countries. I also think that as a language teacher, having an international network can be very beneficial for future projects with your students.	195
	Poor collegial interaction	This code includes statements in which participants reported they lacked desired human relationships and professional support (from colleagues) at work. It includes statements in which participants reported feeling different, alienated or disconnected from others, holding radically different views from others, are in conflict with others or feeling inadequate.	As for collaboration with colleagues, everyone does their own thing.	45
	Feeling of missing out	This code includes statements in which participants reported feelings of unpreparedness or of inefficacy, of missing out on information or on pedagogical preparation.	In my internship program, I feel isolated from the "real" teachers. As we are not seen as students nor teachers at the high school, we can't adapt to the school environment totally. We are only socialising with other interns but not with other teachers who can give us clues about teaching.	12

Table 5.2.   Continued

CODE	SUB-CODE	DEFINITION	EXAMPLE	FREQUENCY
Administrative Isolation	Distribution of teaching and administrative load and scheduling	This code includes statements in which participants reported unsupportive educational administrative settings (school structure and organisation, an overburden of bureaucratic, non-teaching tasks, …).	We work under heavy conditions and the school principal always pushes us to produce projects, yet we don't have the resources required for project implementation.	10
	Equipment and suitable materials offered	This code includes statements in which participants reported provision of adequate materials and equipment as a relieving factor of their isolation.	(…) we have already shared tips and ideas and also different digital tools, for example tools to practice pronunciation.	8
	Lack of administrative support to acquire equipment and materials	This code includes statements in which participants reported lack of administrative support to acquire equipment and materials.	Our students come from […] ghetto-like areas. Most students come to school without eating for days, especially after the weekend. Most of their families struggle just to put food on the table and keep a roof over their heads.	25
	Lack of recognition and appreciation	This code includes statements in which participants reported lack of appreciation and recognition from within the school community and administration.	Contracted teacher in school and only visit the school when I have classes. Sometimes I feel not a part of the school.	5
	Lack of training offered	This code includes statements in which participants reported a lack of adequate pedagogical training as an aggravating factor of their isolation.	We do not have any teacher training courses, which if happen – from now and then, they are really very scarce and poor in real information, a lot of "water".	8

Main Qualitative Findings and Discussion

This section presents findings from the qualitative data analysis to further examine how the VE contributed (or not) to the reduction of teachers' and student teachers' perceptions of isolation. We first summarise teachers' and student teachers' general feelings of isolation, which emerged from the surveys (as reflected in the codebook, see Table 5.2). Next, we discuss in greater detail how their engagement in VE potentially impacted their sense of isolation as reflected through selected quotes, and how this relates to the quantitative findings discussed above.

General Perceptions of Isolation

Overall, teachers experienced feelings of ***geographical, physical,*** and ***spatial isolation*** due to their professional status, for instance being the sole teacher in a department or having a temporary contract. Commuting long distances, limited access to professional development opportunities, and a lack of occasions and colleagues to collaborate with were given as factors further exacerbating this type of isolation. Additionally, the size of the school and administrative conditions, such as working in private schools or being appointed to remote areas, were elements contributing to geographical, physical, and spatial isolation. In contrast, student teachers perceived geographical, physical, and spatial isolation slightly differently. Some student teachers mentioned factors like teaching in private settings or locations where collaboration is discouraged, leading to a sense of detachment from their peers. Geographical isolation was a concern for a few student teachers, particularly those residing in rural areas.

Teachers' feelings of ***emotional isolation*** grew when they experienced poor collegial interaction, for example, lack of human contact and space to discuss concrete pedagogical problems, when other teachers resisted collegial interaction to solve a school problem, or when they were in conflict with others. The challenges of teaching a multicultural and multilingual classroom or dealing with students facing socio-economic difficulties or displacement were also reasons given for reinforcing emotional isolation among teachers. Underlying these were perceptions of not feeling trusted,

respected or connected to school and colleagues, of being disengaged and unmotivated. Student teachers' feelings of emotional isolation were often linked to lack of opportunities to really engage as teachers with other teachers. They attributed this partly to their status as student teachers, but also, to some degree, to the general lack of cooperation between teachers in their schools.

Administrative isolation was identified by teachers as a lack of adequate pedagogical training or where they missed sufficient administrative support to acquire equipment and materials. It was also related to not being aligned with the school culture, with other teachers, feelings of being left out, of not being accepted for what they were or of feeling unable to fit in. Another factor aggravating feelings of isolation was a lack of recognition and appreciation from within the school community and administration. Furthermore, these teachers named adverse educational administrative settings, such as insufficient or non-existent professional support at school, an overburden of work or bureaucratic, non-teaching tasks as a source for feelings of isolation. Student teachers on placements also experienced administrative isolation, relating it to a lack of confidence in applying what they had learned or knowing how to seek appropriate guidance or support when needed. Student teachers who felt isolated often attributed it to a misalignment between their own pedagogical beliefs and the school's ethos and practices.

It should also be noted that the first round of qualitative data on isolation occurred close to the end of the COVID-19 pandemic and had an impact on the responses from both teachers and student teachers. Their focus of isolation was principally regarding online learning and the post-COVID-19 return to classes rather than responses regarding the VALIANT VE. That said, the data are useful to profile some of their perceptions regarding teacher isolation. The pandemic lockdown significantly increased the isolation experienced by participants, generating feelings of physical, spatial, and geographical professional isolation. However, some teachers indicated that the lockdown brought about a positive shift in perspective, now perceiving the use of technology and remote online teaching as an opportunity for professional growth and a way to connect with educators and colleagues beyond their immediate surroundings. Student teachers also found certain advantages during the pandemic, such as having more time for other activities and the opportunity to enhance their subject knowledge through self-learning.

We now consider the impact the VEs had on the feelings of isolation, with individual examples of the categories.

Impact of VE: Relativising Geographical Isolation

Both groups of teachers (those who felt isolated or somewhat isolated and those who did not feel isolated) stated that they felt less professionally isolated and more acknowledged in their own professional approaches and beliefs when they networked with other teachers in the VE. This stemmed from their realisation that they shared similar concerns, issues and feelings. In some contexts, the VE resulted in regular meetings for teachers that were understood and appreciated as opportunities to develop new learning, find out about novel teaching approaches and create contact networks for future use.

> Teacher: *[…] With this exchange I was able to see new strategies to use in my classes and I* came to the conclusion *that I am not alone.*

Teachers who claimed to feel isolated realised that isolation may be just a geographical aspect. They were the ones to suggest keeping up the connection established beyond the duration of the VE and who showed increased sensitivity and empathy to differences in school contexts.

> Teacher: *[…] Discussing more delicate issues, such as education for democracy with some colleagues, who worry to say anything about this, because they fear the government, showed me how privileged I am since I can speak my mind so freely.*

These teachers understood that as problems in schools grow more complex, there are other alternative support structures besides the local professional school community that can be used to solve them.

> Teacher: *I consider the VE project as an occasion to make one more step in my education as a teacher and move beyond a traditional class. I would like to follow further trainings […]*

For the student teachers, positive collegial interaction in the VE was also closely associated with the ability to overcome geographical separation. They too expressed that participating in the VE provided them with a

broader perspective, enabling them to compare their needs and performances with those of others.

> *Student teacher: It is really nice to talk about how individuals experience the same project, lectures and also studies in different countries. What procedure does one have to go through to become an English teacher? What practices are advocated for in your country? We are all taking the same paths but have to go through different processes.*

Discovering that many others faced similar challenges made them feel validated and included, and fostered a greater sense of connectedness.

> *Student teacher: Getting to know first-hand that teachers and student teachers are able to interact and collaborate online that easily has been the greatest impact. I have always thought that it would be more difficult to have the chance to discuss topics like these or share points of view with other colleagues from other countries.*

Opportunities to engage with peers during the VE, despite geographical distances, helped them recognise universal problems they shared with others and find common ground in their collective experience, facilitating positive collegial interaction. In particular, the student teachers appreciated opportunities to share knowledge, perspectives, and some even initiated new international projects.

> *Student teacher: This exchange allows me to create new friendships with people with similar interests and work ethics as me. This can be so helpful in my future since I can count with them in order to exchange ideas or work in different projects.*

Impact of VE: Promotion of Positive Collegial Interaction

The teachers' overall opinion was that VE promoted positive collegial interaction and was beneficial for the professional careers of teachers and for diminishing feelings of emotional isolation. For instance, positive collegial interaction was described as the opportunity to collaborate among peers to develop projects and resources that are meaningful and enriching for professional practice.

> *Teacher: […] it helps us feel less isolated professionally, because we develop projects and get connected to each other.*

Similarly, team collaboration was regarded as enjoyable, because of meeting similarly-minded people, and valuable as an opportunity to share knowledge and to integrate (or enlarge) international support networks. The online collaborative work connected the teachers and made them feel less isolated professionally: they could discuss work with other teachers; they developed skills and expertise; they felt connected and therefore more active; they were encouraged to learn from others and to reflect on their own practice; and they felt more resilient to change in the profession.

> *Teacher : […] In the future, I will be able to send a WhatsApp message to my partners if I have any questions or if I need help.*
> *Teacher : […] I feel I am not lonely anymore. Before, I sometimes felt confused because I had nobody to discuss my work. Now, since I have met many friends through this project I got a lot of inspiration. (tenses corrected by authors)*

This professional networking was seen as having several advantages, namely: the possibility to share and exchange ideas, to collaborate online, to share and access new resources and new learning, to engage in frank and open discussions on concrete classroom problems with peers, in sum, of being part of a wider community of practice.

> *Teacher: […] becoming aware of a teacher community outside of school/online […]*

When teachers engaged in online discussions and collaborative team work to solve concrete classroom problems or learn new content they could apply to their classrooms, they received recognition for what they did, which in turn increased their confidence in their own skills and impacted positively their professional engagement. By building connections that fostered belonging to an online international teacher community, teachers felt heard and respected, as well as legitimised in actions that did not usually receive local recognition. This contributed to a continued motivation to engage in VE.

> *Teacher: Since I feel disconnected from my fellow teachers at school, I would like to create a way to connect all of us. Positive results would be mutually beneficial. (…) As a result of this Virtual Exchange, I've realised how important it is to collaborate and connect with other teachers, so I intend to incorporate it into my life.*

Positive collegial interaction contributed to professional self-validation and a sense of community, which in turn augmented teachers' resilience in face of difficulties and diminished their emotional isolation.

> *Teacher: (…) I feel I am not lonely anymore. Before, I sometimes felt confused because I had nobody to discuss my work. Now, since I have met many friends through this project I got a lot of inspiration.*

For the student teachers, collegial interaction was also an important factor related to feelings of isolation (or non-isolation). As mentioned in the previous section, the VE was seen as a positive opportunity for collegial interaction, as it allowed students to freely discuss common topics, connect with other students and teachers, and share insights, ideas, and resources. In particular, as seen in the quantitative data, the students appreciated the chance to work with "real" teachers.

> *Student teacher: As they are all experienced teachers, I feel like I'm learning from the best. They are professional too, which positively influences my understanding of the topics.*

It also provided a platform for learning about real school problems, and professional networking at an international level. Mentorship arose as a factor related to their sense of isolation – at times favourably but less than positive for others. For example, one student teacher explained that she felt isolated from "real" teachers because they (student teachers) did not belong to any defined collective at the school. They were neither pupils nor teachers and usually only socialised with other interns. However, in the VE there were opportunities for interaction with experienced teachers.

> *Student teacher: (…) in my practicum school, I do not feel comfortable talking with my mentor teacher about the questions in my mind. I feel timid towards her because she looks unwilling towards everything. But, in this project, I know my questions and concerns will be addressed, as all the mentors are preparing with sources and their experiences to help us.*

Even the student teachers who did not initially identify as isolated, mentioned VE as a means of positive collegial interaction, emphasising the chance to engage in meaningful discussions, both with their other (diverse) peers and teachers.

> *Student teacher: (…) [I] never have ever interacted with a professional teacher (…) prior to this exchange program. I have learned the techniques, strategies to teach; yet, I have not heard many experiences from teachers. Therefore, this exchange helped me feel less isolated.*

Impact of VE: Relativising Own Biases and Expanding Professional Models

The VE provided teachers with opportunities to engage in discussions and gain expertise from diverse cultural and educational perspectives, which were not readily available in their local settings, thus broadening their perspectives for a more global outlook. They valued the unique international collaborative work teams and opportunities to engage in co-learning with their peers. Collaborating online with fellow teachers, student teachers, and educational experts expanded their knowledge and understanding of professional aspects that they would not typically have access to. Moreover, VEs served as extrinsic motivation for some participants to re-ignite their passion and commitment to the teaching profession.

> *Teacher: I felt isolated and disconnected at work initially. I felt demotivated. However, later on when I involved my pre-service teachers in a Virtual Exchange study with a group of Mexican students and teacher educators, I regained my motivation to work. Being part of an international network of teacher educators made me feel empowered and supported.*

Implementing positive collegial interaction in a VE is a complex task that necessitates specific intercultural communication skills and attitudes (EVALUATE Group, 2019). The data seems to reveal that the majority of teachers demonstrated these attributes. They recognised that being part of an international community of practice was a continuous journey and not an end in itself; and it is distinct from interactions within smaller (local) groups. Belonging to this community required them to approach discussions with humility, actively listening to others' perspectives in order to gain a deeper understanding of shared challenges across diverse school contexts and cultures.

> *Teacher: I've realized that the problems students encounter are very similar to those of us. As mentors, I am trying to help mentees as much as possible along with my distant colleagues.*

The teachers willingly challenged their own assumptions, actively mitigating confirmation bias, and displayed openness and respect towards differing viewpoints and willingness to learn from others.

Teacher: I want to help other people and be more productive. I think that was the feeling I had after the last session. I can teach better but I was just procrastinating extra work. The ideas I got from the sessions made my teaching better. I even brought a board game to the class after one session and adapted it to the curriculum:)

They valued authentic peer conversations and collaborative work as a means to expand their professional models and incorporate newfound knowledge into their teaching practices.

Teacher: (…) a truly collaborative work setting with other teachers

The student teachers also valued the opportunity to learn more about the general contexts of their peers in other countries and to receive feedback, as well as new input on their own ideas regarding educational strategies such as motivating students and assessment practices, in addition to discovering new digital technologies and teaching approaches.

Student teacher: (…) I have now the vision that our future profession has a wider spectrum of possibilities and that it has a lot of research groups behind seeking for a continuous improvement. There is a huge community of teachers willing to share their experiences and to innovate for the common welfare of society and learning.

They also realised that their future need not be isolated.

Student teacher: I realised that teachers are very active and helpful towards one another, and I saw I won't be isolated when I start teaching as a job.
Student teacher: When I saw that teachers were very willing to collaborate, I realised that doing your job with passion and love is very important. This made me realise that even though I'm just a student now, I would like to/have to participate in such projects for professional development and meeting other people from the field in the future as a teacher to further my career.

Impact of VE: Online Team Building and Participation Problems

The teachers' responses indicated that problems related to emotional isolation arose when online team building and monitoring were not closely attended to by facilitators. Problems also occurred when participants were perceived as failing to demonstrate support to other team members in their views or not complying with their responsibilities to the team, even using the online learning environment as an excuse to dodge responsibilities.

Time keeping was relevant when working together as a team, as was attending all sessions, and being active in all sessions. Teachers complained sometimes of uneven distribution of team members (e.g., one teacher and many student teachers instead of several teachers and several student teachers).

> *Teacher: I was the only teacher who contributed and I felt alone a bit.*

Teachers also mentioned that some participants did not show up for synchronous meetings, provoking feelings of discomfort, anxiety and stress.

> *Teacher: In general, I am loving the experience. I find it difficult to work in small groups because many people are absent or arrive late or come and go and don't give time for anything. The result of our work is poor because the interactions were insufficient. We barely exchange ideas.*

As seen in the above quote, teachers felt that the interaction lacked depth in regard to some online team members who only shared ideas but did not delve into "real" authentic issues that needed to be approached with dedication and seriousness.

> *Teacher: I felt really sorry to see educators and future educators not willing to contribute, or even ghosting the whole project they promised to complete at a time.*

The feeling of emotional isolation could increase when online team building failed to accommodate a participant's point of view or when the feeling of missing out on what was expected by the profession was not received with respect and exchange by others:

> *Teacher: I feel like I am the only one in the profession that tries to follow the rule book, do everything as it should be done. I felt more isolated.*

Conclusion and Recommendations

This study set out to explore how VE impacted teachers and student teachers' sense of isolation, and how engagement in VE promoted sustainable

professional online international collaboration. A mixed methods approach was used that combined quantitative and qualitative data analysis, the main findings of which were that VE had an impact on the participants' sense of isolation, although at times, moderate to low.

For all participants (including those who indicated that they felt isolated and those who did not) engaging in VE promoted positive collegial interactions which alleviated *feelings of emotional isolation*. Through these exchanges, they came to realise that they shared similar concerns, issues, and emotions, leading to a sense of camaraderie. In some cases, the VE interactions have even resulted in regular (post-exchange) meetings.

VE played a crucial role in expanding the local professional community and *relativising geographic, spatial* and *physical isolation*. VE enabled teachers to broaden their perspectives, challenge biases, and *expand their professional models* by engaging in collaborative project development, resource sharing, and networking. It provided them with opportunities to acquire new skills, gain expertise from diverse backgrounds, and embrace alternative teaching approaches not readily available in their local context while *relativising their own biases*. Participating in the international online teacher community provided teachers with a sense of acknowledgement, respect, and validation for their actions, even those who may not receive recognition locally. Similarly, for student teachers, engaging in a VE with teachers provided a safe space to discuss and reflect on observed or anticipated professional challenges, highlighting the potential of VE as a resource to address professional isolation.

In some ways, these qualitative findings seem to contradict the quantitative findings as measured by the isolation scale, which indicated low levels of impact on teachers' isolation. There was also a small but significant increase in feelings of isolation reported by student teachers (who did not initially report feeling isolated) on teaching placements after completing the exchanges. These findings may be due to several factors. Regarding administrative isolation, participating in an online VE did not necessarily alleviate the challenges faced by teachers in their respective schools, such as the lack of technological resources, being the sole teacher in a remote rural area, or experiencing a disconnect with the school's ethos. On the contrary, interacting with others through the VE might have even exacerbated the feelings of isolation. Also, online VEs might have been unable to fully replace the value and expectations that student teachers had for face-to-face socialisation and collaboration, especially after enduring

a two-year period of remote online communication due to the COVID-19 situation.

In regard to the implementation of the VEs, participants' feelings of isolation may have remained largely unchanged or even risen due possibly to a variety of other factors, one being the relatively short length of the VE program. Moreover, the participants might have felt hesitant to openly discuss some topics or felt their suggested topics for discussion were ignored or that the participation of other members did not meet expectations. At least one student teacher indicated that a perceived lack of participation by the online team lowered her own motivation, leading to increased frustration and a deeper sense of isolation. The extra workload and time requirements related to VE participation may have also resulted in increased feelings of isolation.

These findings imply that online team building has been a sensitive issue in the VE as it sometimes impacted negatively on the sense of isolation of participants. Accordingly, and in line with Wu and Cormican's (2021) notion of shared leadership in project teams for team effectiveness, participants stressed the importance of paying attention to issues such as scaffolding teachers' and student teachers' diversity in technological competence, as well as to time management and commitment to VE, team leadership, team building and role sharing within team building. Furthermore, participants felt length and intensity of the professional development to be relevant aspects to take into consideration when planning similar VEs. In sum, recognising that it may be hard to find common points of interest among all participants, online team building may require flexibility, respect for others' points of view, and an attitude of constant negotiation.

It is important to highlight that, overall, results, both qualitative and quantitative, indicate that participating in VE reduced the participants' sense of isolation. The VE experience as measured by the VE Impact on Isolation survey, which specifically assessed participants' beliefs about the benefits of the VE for building supportive professional communities and connections, was seen as highly positive by both student teachers and teachers. This was even more pronounced for teachers, who reported a significant impact of VE on their sense of belonging and support, and who rated the highest impact of VE on opportunity for professional development. Student teachers' highest rating of VE focused on feelings of connection with others. These quantitative results are further corroborated by the themes that emerged in the qualitative analysis.

The findings are important for all agents involved in education, including ministries. VE has been shown to broaden teachers' and student teachers' perspectives and expose them to innovative teaching methods through the sharing of ideas, best practices, and resources, thus contributing to a much more professional teaching workforce. They appear to increase motivation and engagement, perhaps mitigating the impact of teacher attrition. VE exposes teachers and student teachers (and subsequently their pupils) to diverse perspectives and cultural experiences, deepening their understanding of global issues and promoting cultural competence in their classrooms. And perhaps most importantly, VE experiences that are carefully scaffolded and facilitated by trained instructors can empower teachers and reduce their professional isolation.

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