Robert O'Dowd / Margarita Vinagre (eds.)

VIRTUAL INNOVATION AND SUPPORT NETWORKS: Exploring the impact of Virtual Exchange in teacher education

TELECOLLABORATIVE LEARNING AND VIRTUAL EXCHANGE IN EDUCATION

7

PETER LANG

Virtual Exchange refers to the numerous initiatives and methodologies which engage learners in sustained online collaborative learning and interaction with partners from different cultural backgrounds as part of their study programs and under the guidance of teachers or trained facilitators. This book reports on a large-scale European project, VALIANT (Virtual Innovation and Support Networks for Teachers), which explored how Virtual Exchange can be applied to bring togethaer students of Initial Teacher Education with in-service teachers. The book also examines how participation in these Virtual Exchange initiatives impacted on aspects of teachers' and student teachers' professional development, their motivation levels, sense of professional isolation as well as on their intercultural, digital and other soft skills.

Robert O'Dowd is full professor for English Studies at the Universidad de León, Spain. He has taught at universities in Ireland, Germany and Spain and has published extensively on the application of Virtual Exchange in higher education. He was recently listed in Stanford University's 'Ranking of the World Scientists: World´s Top 2% Scientists'.

Margarita Vinagre is full professor of Applied Linguistics at the Universidad Autónoma de Madrid, Spain. She has published widely on the integration of Virtual Exchange for competence development in higher education.

www.peterlang.com

Virtual Innovation and Support Networks: Exploring the Impact of Virtual Exchange in Teacher Education

TELECOLLABORATIVE LEARNING AND VIRTUAL EXCHANGE IN EDUCATION

Vol. 7

Edited by
Melinda Dooly & Robert O'Dowd

PETER LANG
Lausanne - Berlin - Bruxelles - Chennai - New York - Oxford

Robert O'Dowd / Margarita Vinagre (eds.)

Virtual Innovation and Support Networks: Exploring the Impact of Virtual Exchange in Teacher Education

PETER LANG
Lausanne - Berlin - Bruxelles - Chennai - New York - Oxford

Bibliographic Information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available online at http://dnb.d-nb.de.

Library of Congress Cataloging-in-Publication Data
A CIP catalog record for this book has been applied for at the Library of Congress.

The research reported in this volume was supported by the project Virtual Innovation and Support Networks for Teachers (VALIANT) (626134-EPP-1-2020-2-ESEPPKA3-PIPOLICY). This project is funded by Erasmus+ Key Action 3 (EACEA/38/2019): European policy experimentations in the fields of education, training, and youth led by high-level public authorities. The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

ISSN 3042-4550 pb. ISSN 3042-4569 eBook
ISBN 978-3-0343-4752-5 pb. ISBN 978-3-0343-4923-9 eBook
ISBN 978-3-0343-4924-6 ePub DOI 10.3726/ b21769

This publication has been peer reviewed.

Published by Peter Lang Group AG, Lausanne, Switzerland
info@peterlang.com - www.peterlang.com

Table of Contents

Acknowledgements

The volume is the culmination of the project "Virtual Innovation and Support Networks for Teachers" (VALIANT) which was an Erasmus+ European Policy Experiment which ran from 2021 to 2024 and which was coordinated by Robert O'Dowd at the Universidad de León, Spain. This project brought together academics and public authorities from 8 European countries and involved a total of 17 institutions. The number of colleagues who worked on different aspects of the project has been enormous. While not everyone who worked on the project has contributed as an author to this volume, we hope that they will see their work and ideas reflected in its pages. With this in mind, we wish to acknowledge the invaluable contributions of all the members of the VALIANT team in the implementation of the project and in the development of this volume.

We would also like to acknowledge the hard work and commitment of the teachers and student teachers who took part in the Virtual Exchanges organised as part of this project. The opportunity to work with these colleagues from all over Europe and beyond has been a hugely enriching learning experience for us and their feedback and insights have confirmed for us the value of Virtual Exchange as a form of professional development for those working in education.

The research reported in this volume was supported by the project Virtual Innovation and Support Networks for Teachers (VALIANT) (626134-EPP-1-2020-2-ESEPPKA3-PIPOLICY). This project is funded by Erasmus+ Key Action 3 (EACEA/38/2019): European policy experimentations in the fields of education, training, and youth led by high-level public authorities. The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

The editors – Robert O'Dowd and Margarita Vinagre

Robert O'Dowd & Margarita Vinagre

1. Introduction to the VALIANT study and this volume

Introduction

Recent global and international events such as the COVID-19 pandemic have underlined more than ever the important role which online collaboration and exchange can play in both Continuous Professional Development and in Initial Teacher Education. During the two-years of lockdown and restricted mobility, online networks and platforms enabled both teachers and student teachers to continue to communicate with colleagues, to participate in professional networks and to engage in professional development opportunities. Indeed, some commentators interpreted the impact of the COVID-19 pandemic as an opportunity for innovation and progress in online teacher education. Reflecting on the potential of professional online communities for overcoming teacher isolation in the COVID-19 era, Knight (2020) observed: "[t]he impetus for online collaboration has perhaps never been greater than it is now during the COVID-19 pandemic. …particularly in the case of world language education, it also poses an opportunity to replenish a weak professional development infrastructure" (p. 303).

Of course, the use of online networks to facilitate teachers' collaborative activities was already extensive before the pandemic. Studies have shown how platforms and networks such as UNICollaboration, eTwinning, School Education Gateway and Scientix, as well as specialised teacher communities in social networks such as Twitter and Facebook, had already enabled educators to overcome feelings of professional isolation (Chen et al., 2009), to learn about and share innovative classroom methodologies and uses of educational technologies (Lantz-Andersson et al., 2018), and to engage in intercultural dialogue and establish collaborative partnerships with colleagues from other cultural backgrounds (O'Dowd & Dooly, 2022).

Students in Initial Teacher Education have also been engaged in online learning communities through Virtual Exchange (VE) programmes which bring them into contact with partner classes in other countries. VE has been used extensively in pre-service teacher education programmes to develop students' foreign language, intercultural and digital competences (Carloni & Zuccala, 2018; EVALUATE group, 2019; Dooly & Sadler, 2020; Dooly & Vinagre, 2021), but also to give them first-hand experience of using online collaboration in classes in the hope that they, in turn, will go on and use such projects in their own classrooms in the future (Grau & Turula, 2019; Kurek & Müller-Hartmann, 2019).

Despite this interest in online collaborative communities in both Continuous Professional Development and Initial Teacher Education, there have been relatively few examples of initiatives which have explored bringing cohorts of teachers and student teachers together in online collaboration. This is perhaps surprising, considering the potential benefits which such initiatives could have for both sets of participants. Student teachers stand to benefit from learning first-hand about real classroom experiences and from seeing closer links between what happens in schools and the theoretical content of their university coursework – often an elusive aspect of Initial Teacher Education (Ulvik et al., 2021). The activity also offers teachers the opportunity to share the problems and challenges they encounter in their classrooms and to receive feedback and support from a potentially enthusiastic group of students who are aware of recent methodological developments. It was this form of online collaborative learning and its potential for teacher professional development and for overcoming professional isolation that the VALIANT (Virtual Innovation and Support Networks) study set out to explore.

However, before looking in detail at how the VALIANT study developed the role of online collaborative networks in teacher education, for the sake of clarity it behoves us to briefly review the terminology of online international education.

A Review of Terminology

As digital technologies have been increasingly used in contexts of international education and collaboration, a series of terms have come into use

which are often confused or used interchangeably. These include the terms Virtual Exchange, Virtual Mobility and Blended Mobility. We will now look at each of these to identify their different characteristics.

In this volume, we define Virtual Exchange (VE) as an umbrella term which refers to the numerous learning initiatives and methodologies which engage learners in sustained online collaborative learning and interaction with partners from different countries and cultural backgrounds as part of study or training programmes and under the guidance of teachers or trained facilitators.

Apart from the two basic characteristics of using technology and engaging in intercultural collaboration and exchange, this definition also highlights two further characteristics which are likely to be inherent in all types of VE: first, that the online collaboration forms part of the participants' formal training or study programmes and, second, that it involves the guidance of teachers or trained facilitators.

The first of these is an important part of any definition of VE as it allows us to differentiate between projects which are integrated into educational programmes and more informal intercultural interactions and collaborations which might take place online. For example, students and teachers often interact in online social networks with colleagues and friends from other countries. This may be beneficial for their foreign language skills and their professional development, but this should not be seen as VE. VEs differ from informal online interactions in that VE initiatives are generally integrated in some way into the participants' formal learning and participation in the project is provided with some form of academic recognition, whether it be in the form of grades, credit or microcredentials.

The second point, involving the guidance of teachers or trained facilitators, means that VE recognises that, in order to maximise the learning potential of the online interaction, teachers or trainers need to actively structure the activity, designing effective tasks and providing support and assistance in the online intercultural interactions. As Helm and van der Velden (2020) explain "[i]n contrast to more social online activity such as participation in social networks, VE initiatives are structured and intentionally designed to produce learning outcomes" (p. 3).

Virtual Mobility (VM), on the other hand, is quite a different activity. Although various definitions exist, it essentially refers to the activity

of students following courses online at another institution outside their own country, without physically leaving their own home. Rajagopal et al. (2020), explain that in VM:

> learners enrolled as students in one higher educational institute have the opportunity to follow a course at another higher educational institute in the online mode. As this is institutionally supported, VM participants enjoy the formal advantages of studying at that other institute, such as instructional support and assessment of their performance in the course. Also, the gained credits for a successfully completed VM course are accepted by the students' home institutions and accredited as part of the curriculum (n.p.).

Similarly, in the FRAMES project's report on scenarios for the integration of VE in Higher Education, Pittarello et al. (2020) define VM as "educational practices that allow students from one educational institution to follow courses organised at a different institution (usually based in a different country) without having to leave home" (p. 12).

Finally, a third, related term, Blended Mobility (BM) is a much less well-known form of online international learning. This approach entails combining phases of online learning with teachers and students from other educational institutions, with a period of travel to one of the partner universities to work together in person. Essentially, BM can be seen to integrate activities such as online lectures (VM), online intercultural collaboration (VE) with periods of short-term physical mobility. Sabzalieva et al. (2022) use the term "hybrid student mobility" (HSM) to describe the same concept of incorporating aspects of both physical mobility and virtual activities.

Interest in this activity is currently rising in Europe at least, as the most recent Erasmus+ programme guide (2021), which lays out the European Commission's programme for supporting international student mobility learning for the period 2021–2027, has put a great deal of emphasis on institutions introducing BM into their internationalisation programmes. The programme promotes so-called "Blended Intensive Programmes" which are defined as "short, intensive programmes that use innovative ways of learning and teaching, including the use of online cooperation" (p. 47). These programmes require physical mobility to last between 5 days and 30 days and to be combined with a virtual component facilitating collaborative online learning exchange and teamwork.

The Role of Online Collaboration Initiatives in Teacher Education

As was pointed out at the beginning of this chapter, online collaboration has been used in different ways in the area of teacher education. For example, the activity of engaging students of Initial Teacher Education in VE projects with other classes of future teachers has been widely reported in the literature. There are a large number of studies in the literature which report on single, class to class VEs in this area (Dooly & Sadler, 2020; Grau & Turula, 2019; Uzum et al., 2020; Wu, 2021), while large-scale studies such as EVALUATE (Evaluating and Upscaling Telecollaborative Teacher Education) have provided a framework of training and project design which has brought together hundreds of student teachers (The EVALUATE Group, 2019). Between 2017 and 2018, the EVALUATE consortium worked with teacher trainers from 34 institutions of Initial Teacher Education and organised 25 VEs which involved over 1000 student teachers. The majority of institutions were from Europe but teacher trainers from the United States, Brazil, Israel, Turkey and Macau also took part in the initiative which was an Erasmus+ European Policy Experiment. In the project, the classes of Initial Teacher Education were matched together and engaged in a period of intensive VE with partner classes in institutions in other countries based on specifically designed tasks and content related to pedagogical digital competence as well as intercultural competence.

The underlying motivation for introducing VE into Initial Teacher Education is to give student teachers experiential learning opportunities in innovative educational practices which they will themselves go on to integrate into their teaching in the future. In European school education, VE has already been used for the development of students' competences in the form of eTwinning (Education for Change, 2013). In the USA, the Bureau of Educational and Cultural Affairs at the US Department of State as well as organisations such as iEARN and ePals have also done much to promote this practice in pre-university education. In order for primary and secondary school teachers to understand the value of VE and how it functions, teacher educators argue that student teachers should experience it first-hand during their initial training programmes.

However, despite this recommendation, the practice of bringing together teachers and student teachers in collaborative learning initiatives has not been extended and studies are still scarce. Such initiatives are undoubtedly worth exploring as they reflect a sociocultural approach to initial teacher education and professional development (Johnson, 2009). By bringing student teachers into contact with teachers and engaging them together in collaborative activities based on the challenges and processes of real classrooms, new opportunities emerge for teacher education. Some examples of such an approach will be looked at here briefly.

Meskill et al. (2006) reported on a project which brought together novice pre-service teachers, in-service educators and doctoral students in collaborative project work. Both the new and experienced teachers worked together in classes, combining the technology skills of the former with the pedagogical expertise of the latter in order to integrate innovative technology enhanced activities into their classes. The doctoral students served as mentors to both these groups during the project work. In a similar approach, also based on sociocultural approaches to teacher education, Schocker von Ditfurth and Legutke (2002) combined the work student teachers do in their university classrooms with the work of real foreign language classrooms. While participating in their university course, student teachers coordinated with an in-service teacher to prepare online projects for their students and then accompanied the in-service teacher to class in order to carry out the projects. They then returned to the university to share and reflect on their experiences in their teacher training course.

Cutrim Schmid and Hegelheimer (2014) investigated a Computer Assisted Language Learning (CALL) teacher education programme that included pre-service/in-service teacher collaboration. Their research showed that the collaboration between these two groups helped the teachers in furthering their professional development in different ways, such as receiving technical support for the design and implementation of technology-enhanced tasks, learning from their student partners about new pedagogical approaches and enhanced motivation through collaboration. The authors attributed the effectiveness of the pre-service/in-service collaboration that took place in their research to the fact that both groups were involved in a process of shared reflection that occurred in the midst of practice and generated insights that were grounded in a systematic evaluation of teaching and learning processes.

In conclusion, the literature would appear to confirm that connecting teachers and students in online collaboration together enables an alternate, sociocultural approach to teacher training and professional development which is underlined by various beliefs. First, teachers' informal, social and professional networks, including their own classrooms, are ideal locations for professional learning. Second, both teachers and student teachers stand to expand their professional knowledge and their ability to overcome isolation and improve their career paths by working collaboratively with colleagues from other contexts. Finally, by working with colleagues at all levels of experience and expertise (including student teachers), educators will respect, challenge and support one another as they collectively seek to reach standards of excellence in their work. The VALIANT study reported here aimed to put these principles into practice.

Valiant: A European Policy Experiment

This volume reports the findings of VALIANT (Virtual Innovation and Support Networks for Teachers) which was an Erasmus+ KA3 *European Policy Experiment* project which ran from 2021 to 2024. European policy experimentations aim to help to assess the relevance, effectiveness, efficiency, potential impact and scalability of innovative policy measures through experimental or semi-experimental approaches. Three key actors in European policy experimentations are: the responsible public authorities, the researchers and the target groups. In this case, the consortium was made up of a research team from 11 European institutions of higher education and 6 public authorities made up of regional or national ministries of education from Norway, Spain (2 regional governments), Germany, Slovenia and Portugal.

Between 2021 and 2023, the VALIANT consortium engaged groups of teachers, student teachers and educational experts in different facilitator-driven Virtual Exchanges (VEs) around a wide range of topics such as diversity and inclusion in education, working with Ukrainian refugee children in schools and educational innovation. In total, the consortium ran 24 VEs over three semesters.

Three different overarching models of VE were trialled in teacher education contexts:

1. *Teacher to teacher* Virtual Exchange (6 VEs),
2. *Teacher and student teacher* Virtual Exchange (12 VEs), and
3. *Student to student* Virtual Exchange *(student teachers working with student teachers*) (6 VEs).

In total, 685 participants took part in the 24 VE projects. These included 395 student teachers and 290 teachers or teacher educators. These came from a wide range of European countries.

The hypothesis of the project was that integrating VE programmes into teacher training would provide the target groups (teachers in isolated contexts and classes of student teachers) with opportunities for innovation, collaboration, digital and intercultural competence development and career planning. We also posited that online collaboration in this form would make the teaching profession more attractive to student teachers by engaging them in authentic learning and teaching scenarios.

Overview of This Volume

For the sake of clarity, the terms "teachers" and "student teachers" have been used throughout the book to ensure homogeneity among all contributions. Teachers refers to in-service teachers, while student teachers refers to pre-service or trainee teachers – i.e., students who are preparing to become teachers in the future. Terminology also includes "teacher educators", which has been used to refer to teacher trainers while "educational experts" refers to specialists in a relevant field that have been invited to participate in a VE to share their knowledge and experience with the participants.

Chapter 2 in this volume outlines the 3 VE models which were developed for teacher education as part of the VALIANT project and whose main aim was to provide the target groups (teachers in isolated contexts and student teachers) with opportunities for innovation, collaboration, digital and intercultural competence development and career planning. As mentioned above, these models correspond to the type of participants that were

involved in each particular exchange: (1) teacher to teacher, (2) teachers and student teachers, and (3) student teachers to student teachers. A step-by-step description of the VE implementation, together with examples that illustrate each of these types and a list of good practices have been included in the chapter in the hope that they can be of use to educators planning to run similar projects in the future.

The research methodology will be described in Chapter 3. The study employed an experimental, mixed methods approach to examine the effectiveness of this VE programme. Data was collected at three distinct stages (i.e., pre, mid and post VE in each of the three rounds of VEs). At each stage, both qualitative and quantitative data were collected. The quantitative data allowed us to examine the causal effect of the intervention on feelings of isolation, motivation, self-efficacy, intercultural competencies, professional engagement, digital competences for collaboration and sustainable professional development. Then, in the research analysis stage, the quantitative data was triangulated with the qualitative data (i.e., responses to open-ended questions in the pre-, mid- and post-VE surveys, in addition in some cases to participant diaries, portfolios, interviews) in order to provide a comprehensive insight into the outcomes of the experimentation.

Against this background, the remaining chapters in this volume are organised in the following way. Chapter 4 focuses on the impact of VE on teachers' and student teachers' motivation levels by using Self-Determination Theory (SDT) as the theoretical framework for data analysis. SDT, which focuses on people's personality, inherent growth tendencies and innate psychological needs (Ryan & Deci, 2000), identifies three levels of motivation: (a) *intrinsic motivation*, (b) *extrinsic motivation* and (c) *amotivation*. Within these, 6 regulatory styles are identified that include intrinsic regulation (for intrinsic motivation), integrated regulation, identified regulation, introjected regulation and external regulation (for extrinsic motivation) and non-regulation (for amotivation). The authors elaborate on the positive effects that VE can have on teachers' and student teachers' intrinsic motivation to teach, and how it has the potential to enhance motivation towards performing professional tasks, increase a sense of self-worth and enthusiasm for their profession, and improve motivation to inspire and motivate their (future) students.

Chapter 5 investigates whether VE contributes to overcoming teachers' and student teachers' sense of isolation and low motivation in rural areas and other isolated contexts, while promoting their effectiveness in online

international networks of professional collaboration. With this research objective in mind and given the lack of previous conceptual frameworks in the field, the authors develop a framework based on an extensive literature review that identifies categories 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). Findings and discussion suggest that engaging in VE can promote positive collegial interaction which alleviates feelings of emotional isolation, at the same time it can play a crucial role in expanding the local professional community and relativising geographic, spatial and physical isolation.

Chapter 6 explores how VE can affect the development of teachers' and student teachers' digital collaboration skills. In the context of VE as a pedagogical practice, the skills of digital literacy also require the skills inherent to collaboration and interaction through digital means. To investigate these aspects, the Digital Competence Framework for Citizens (DigComp) 2.1 (Carretero Gomez et al., 2017) was applied as a useful lens for merging the digital skills, knowledge and attitudes required when collaborating through technologies. This conceptual model identifies 5 key areas (Information and data literacy, Communication and collaboration, Digital content creation, Safety and Problem solving) and 21 sub-competences that are pertinent to these areas. The authors discuss how the participants perceived notable improvements in their ability to navigate online networks, enabling them to effectively collaborate with others, develop digital resources and knowledge, and advance professionally. Additionally, engaging in VE also enhanced their digital attitudes even among those who initially held a positive mindset toward digital technologies.

Chapter 7 analyses the impact that VE can have on teachers' and student teachers' intercultural competence development (Deadorff, 2006; Risager, 2007). To investigate this aspect, the authors followed Byram's (1997), model of intercultural communicative competence that includes core attitudes, skills and knowledge. The authors identified as the main challenge for intercultural competence development participants' mistaken perceptions regarding how this competence is developed. Despite this challenge, both teachers and student teachers perceived that they had developed intercultural skills that were essential for their teaching careers, such as willingness, confidence and ability to work in intercultural teams

as well as to work collaboratively online and build high quality digital pedagogical materials. Other benefits refer to acknowledging the importance of adopting intercultural behaviours in teaching and of adapting their communicative style to reach an intercultural audience.

Chapter 8 examines VE impact on teachers' and student teachers' professional development. The chapter starts by introducing relevant concepts such as teacher self-efficacy (Künsting et al., 2016; Bach, 2022) and transversal or soft skills (Mourshed et al., 2014; Cinque, 2016), and selects 4 transversal skills for analysis in this study: (1) team work, (2) negotiation of skills, (3) time-management, and (4) problem-solving. Results are interpreted in the light of Bandura's (1997; 2006) conceptual model which is organised around four main factors: mastery experiences (own success experiences), vicarious experiences (observing others), verbal persuasion (verbal encouragement), and physiological and affective states (emotional reactions to specific tasks). The authors suggest that participants perceived they had engaged in significant mastery and vicarious experiences which in turn had led to improving their teaching skills; at the same time, specific transversal skills such as problem solving and time management were perceived to be the most developed in VE. Other perceived gains included having the chance to receive constructive feedback and developing professional knowledge.

Finally, Chapter 9 is a compilation of 3 case studies that present in depth approaches to specific VEs implemented during the project. Case study 1, called *Virtual Exchange for Teacher to Teacher Collaboration*, was centred around the theme of diversity and inclusion in the classroom and was designed to assist teachers with integrating all students into their courses, irrespective of socioeconomic status, linguistic or educational backgrounds, and achievement level. Participants from Spain, Portugal, Turkey and Germany were engaged in the VE and results from the quantitative and qualitative data analysis showed highly encouraging trends in the development of teachers' intercultural competences, problem-solving, teamwork, self-efficacy, and digital competences. Participants also acknowledged the benefits of VE to increase their confidence when using digital tools in learning (de Jong, 2012), their self-efficacy as teachers and their ability to practise the English language. The VE experience also motivated teachers to organise VEs for their students so that students could benefit from developing intercultural communication competences and digital collaboration skills in this learning environment.

Case study 2, titled *Virtual Exchange for Teacher and Student Collaboration,* was also on the theme of the diversity and inclusion in our classrooms. This VE invited teachers to consult with student teachers and to share the experiences and challenges that they were facing regarding diversity and inclusion in their classrooms. This VE also brought together a range of different types of students with various backgrounds and levels of prior teaching experience. This VE was integrated in the two partner classes at Malmö University (MAU) in Sweden, and at the University of Maryland, Baltimore County (UMBC) in the United States (US). In addition, teachers, from Slovenia and Germany, served as expert consultants. Results from the quantitative and qualitative data analysis suggest that the participants benefited from the VE in different ways depending on their roles. Both teachers and student teachers developed digital skills and team working skills. The student teachers demonstrated a gain in intercultural behaviour, while the teachers reported an increase in their self-efficacy and time management, and the tasks and structure of this VE were found to be an effective tool for preparing student teachers to carry out culturally responsive practices in their future classrooms.

Finally, Case study 3 titled *Virtual Exchange for Student to Student Collaboration* followed a "class-to-class" format and was carried out between student teachers at the University of Education Schwäbisch Gmünd (PHSG) in Germany and student teachers at the Universidad Autónoma de Madrid (UAM) in Spain. The theme of the exchange was the integration of technology in the foreign language classroom. The main objectives were for participants to gain experience in online collaboration with international peers, facilitate networking between university students from different European countries, share experiences, practices and ideas from different European classrooms, and develop a lesson plan with tasks and materials that would fully integrate technology. Quantitative and qualitative analysis revealed that participants developed their digital competences and time management mostly, and that VE collaboration also fostered the development of self-efficacy and confidence among participants in their ability to teach. Collaboration also emerged as a crucial aspect that served as a valuable tool for successful knowledge exchange and the improvement of teaching quality.

We hope this volume will be of interest to the academic community working in the areas of teacher education, digital approaches to education

and internationalisation of higher education. Public authorities, educational decision makers and school administrators interested in the area of online professional development for teachers will also find the book relevant.

Bibliography

Ballantyne, J., & Zhukov, K. (2017). A good news story: Early-career music teachers' accounts of their "flourishing" professional identities. *Teaching and Teacher Education*, *68*, 241–251. https://doi.org/10.1016/j.tate.2017.08.009

Bach, A. (2022). Selbstwirksamkeit im Lehrberuf: Entstehung und Veränderung sowie Effekte auf Gesundheit und Unterricht (Pädagogische Psychologie und Entwicklungspsychologie 101) (1st ed.). Detlef H. Rost. https://doi.org/10.31244/9783830995166

Burton, M., Brown, K., & Johnson, A. (2013). Storylines about rural teachers in the United States: A narrative analysis of the literature. *Journal of Research in Rural Education*, *28*(12), 1–18.-o

Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. Multilingual Matters.

Carloni, G., & Zuccala, B. (2018). Blending Italian "down-under": Toward a theoretical framework and pragmatic guide for blending tertiary Italian language and culture courses through Skype-enhanced, pre-service teacher-centred telecollaboration. *LEA – Lingue e Letterature d'Oriente e d'Occidente*, *7*, 405–445. https://doi.org/10.13128/LEA-1824-484x-24408

Chen, Y., Chen, N.-S., & Tsai, C.-C. (2009). The use of online synchronous discussion for web-based professional development for teachers. *Computers & Education*, *53*(4), 1155–1166. https://doi.org/10.1016/j.compedu.2009.05.026

Cutrim Schmid, E., & Hegelheimer, V. (2014). Collaborative research projects in the technology-enhanced language classroom: Pre-service and teachers exchange knowledge about technology. *ReCALL*, *26*(3), 315–332. https://doi.org/10.1017/S0958344014000135

de Jong, O. (2012). Empowering teachers for innovations: The case of online teacher learning communities. *Creative Education*, 3 (8).,125-129. https://doi.org/10.4236/ce.2012.38B026

Deardorff, D. K. (2006). Identification and assessment of intercultural competence as a student outcome of internationalization. *Journal of studies in international education, 10*(3), 241-266. https://doi.org/10.1177/102831530628

Dooly, M., & Sadler, R. (2020). "If you don't improve, what's the point?" Investigating the impact of a "flipped" online exchange in teacher education. *ReCALL*, 32(1), 4–24. https://doi.org/10.1017/S0958344019000107

Dooly, M., & Vinagre, M. (2021). Research into practice: Virtual exchange in language teaching and learning. *Language Teaching*, 1–15. https://doi.org/10.1017/S0261444821000069

Education for Change (2013), Study of the impact of eTwinning on participating pupils, teachers and schools: Final report. Luxembourg: Publications Office of the European Union.

European Commission. (2021). *Erasmus+ Programme Guide 2021–2027.* https://erasmus-plus.ec.europa.eu/programme-guide/erasmusplus-programme-guide

Grau, M. K., & Turula, A. (2019). Experiential learning of telecollaborative competences in pre-service teacher education. *Language Learning & Technology*, *23*(3), 98–115. http://hdl.handle.net/10125/44698

Helm, F., & Van der Velden, B. (2020). Erasmus+ Virtual Exchange Impact Report 2019. Publications Office of the EU. https://op.europa.eu/en/publication-detail/-/publication/0ee233d5-cbc6-11ea-adf7-01aa75ed71a1/language-en

Johnson, K. (2009). *Second language teacher education*. New York, NY: Routledge.

Knight, S. W. P. (2020). Establishing professional online communities for world language educators. *Foreign Language Annals*, *53*(2), 298–305. https://doi.org/10.1111/flan.12458

Kurek, M., & Müller-Hartmann, A. (2019). The formative role of teaching presence in blended Virtual Exchange. *Language Learning & Technology*, *23*(3), 52–73. http://hdl.handle.net/10125/44696

Künsting, J., Neuber, V., & Lipowsky, F. (2016). Teacher self-efficacy as a long-term predictor of instructional quality in the classroom.

European Journal of Psychology of Education, 31(3), 299–322. https://doi.org/10.1007/s10212-015-0272-7

Meskill, C., Anthony, N., Hilliker-Van Strander, S., Tseng, C., & You, J. (2006). Expert-novice teacher mentoring in language learning technology. In P. Hubbard & M. Levy (Eds.), *Teacher education and CALL*, (pp. 283–300). John Benjamins.

O'Dowd, R., & Dooly, M. (2022). Exploring teachers' professional development through participation in Virtual Exchange. *ReCALL*, *34*(1), 21–36. https://doi.org/10.1017/S0958344021000215

Pitarello, S., Beaven, A., & van der Heijden, C. (2020). *Scenarios for the integration of Virtual Exchange in Higher Education*. *FRAMES project*. https://zenodo.org/record/5573614#.YnKMHtpBw2w

Rajagopal, K., Firssova, O., Beeck, I. O. de, Stappen, E. V. der, Stoyanov, S., Henderikx, P., & Buchem, I. (2020). Learner skills in open virtual mobility. *Research in Learning Technology*, *28*. https://doi.org/10.25304/rlt.v28.2254

Risager, K. (2007). *Language and culture pedagogy: From a national to a transnational paradigm*. Vol. 14. Multilingual Matters.

Rogers, D. L., & Babinski, L. M. (2002). *From isolation to conversation: Supporting new teachers' development*. State University of New York Press.

Ryan, R. M. & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist*, *55*(1), 68–78. https://doi.org/https://doi.org/10.1037/0003-066X.55.1.68

Sabzalieva, E., Mutiza, T, & Yerovi, C. (2022). *Moving minds: Opportunities and challenges for virtual student mobility in a post- pandemic world*. https://www.iesalc.unesco.org/wpcontent/uploads/2022/03/IESALC_220315_REVSMEN.pdf

Schocker-von Ditfurth, M., & Legutke, M. K. (2002). Vision of what is possible in teacher education – Or lost in complexity? *ELT Journal*, *56*(2), 162–171.

The EVALUATE Group. (2019). *Evaluating the impact of Virtual Exchange on initial Teacher Education: a European policy experiment.* Researchpublishing.net. https://doi.org/10.14705/rpnet.2019.29.9782490057337

Tsang, K. K. (2018). Teacher alienation in Hong Kong. *Discourse: Studies in the Cultural Politics of Education*, *39*(3), 335–346. https://doi.org/10.1080/01596306.2016.1261084

Ulvik, M., Stokker Jensen, V., & Eide, L. (2021). Student teachers' online sharing of challenging incidents in practice placement. *European Journal of Teacher Education*, 1–15. https://doi.org/10.1080/02619768.2021.1985457

Üzüm, B., Akayoglu, S., & Yazan, B. (2020). Using telecollaboration to promote intercultural competence in teacher training classrooms in Turkey and the USA. *ReCALL*, *32*(2), 162–177. https://doi.org/10.1017/S0958344019000235

Wu, S. (2021). Unpacking themes of integrating telecollaboration in language teacher education: a systematic review of 36 studies from 2009 to 2019. *Computer Assisted Language Learning*, 1–23. https://doi.org/10.1080/09588221.2021.1976800

Pia Sundqvist & Robert O'Dowd

2. The VALIANT model of Virtual Exchange

Introduction

Virtual Innovation and Support Networks are defined as Virtual Exchange (VE) programmes which bring together teachers, student teachers, teacher educators and educational experts in facilitated online collaboration around real-world educational issues (Sundqvist & O'Dowd, 2022). This chapter provides an overview of the methodology underlying the VALIANT exchanges and presents examples of different VE models that were developed as part of the project. In undertaking this initiative, our aim is to assist fellow educators and program developers interested in orchestrating diverse VE programmes within the realm of teacher education. Some educators might find value in incorporating one of our VE models into their respective projects, while others may opt to craft a new VE, drawing inspiration from the examples presented in this chapter.

Regarding inspiration, as organisers of numerous VEs in several rounds, we learned a great deal from running the exchanges. Thus, to inform and hopefully also inspire readers, we conclude by providing some good practices that we have identified.

As highlighted in the introductory chapter of this volume, the overarching objective of the VALIANT project was to examine the hypothesis that the incorporation of VE programmes into teacher training initiatives could offer target groups (specifically, teachers in isolated contexts and student teachers) opportunities for fostering innovation, collaboration, digital and intercultural competence, as well as career planning. These opportunities might otherwise be challenging to access in rural areas or during periods of mandated isolation, such as the COVID-19 pandemic. Additionally, our goal was to assess whether the developed VE programs enhanced the appeal of the teaching profession to student teachers by involving them in authentic learning and teaching scenarios.

As outlined in Sundqvist and O'Dowd (2022), the specific objectives of this policy measure were to achieve the following:

(1) To overcome teachers' sense of isolation and to improve levels of motivation through the networking and collaboration opportunities which emerge from participation in the Virtual Exchange programmes.
(2) To develop teachers' intercultural collaboration skills as well as their ability to participate in online collaborative projects and networks (i.e., eTwinning, Erasmus+ KA2 proposals) which are essential for teaching in the modern European classroom.
(3) To develop teachers' ability to use digital technologies for elements of digital professional engagement including professional collaboration, reflective practice and digital continuous professional development (see the DigComp model of teachers' digital competences).
(4) To raise the awareness of students of Initial Teacher Education of the realities of the teaching profession through online collaboration with in-service teachers across Europe.
(5) To provide practicing teachers and students of Initial Teacher Education with resources, support, and strategies for career path planning in order maintain interest and engagement in the profession and empowerment in navigating their careers.

These objectives inevitably shaped how the VALIANT VEs were designed. The particular profile of the participants (teachers and student teachers – many of whom were located in isolated contexts) shaped both the themes of the exchanges as well as the structure of the tasks.

The Methodology of the VALIANT Virtual Exchanges

Within the VALIANT models, educators and student teachers participate in collaborative online activities guided by the principles of project-based and task-based learning, as well as co-learning, with facilitation provided by trained facilitators (Helm, 2016; O'Dowd, 2023).

The VALIANT project's VEs encompass three fundamental models or configurations: (1) teacher-to-teacher, (2) teachers and student teachers, and (3) student teachers to student teachers. The themes developed for each model vary based on the preferences of participating researchers and the specific conditions at the educational institutions involved.

The VE is usually initiated by a short introduction of a current issue faced in the participating institutions, such as refugee integration, inclusion or digital learning. Participants are organised into small groups (referred to as "working groups") which enables a more personal collaborative experience. These groups can involve participants of various disciplines in the same group as this allows for multiple perspectives to emerge.

The initial synchronous online interaction encompasses introductions, on-boarding, and a discussion addressing the current issue, coupled with the sharing of participants' prior experiences and perspectives. Over the subsequent 6–8 weeks, participants typically collaborate to explore solutions or best practices and, when applicable, produce a co-authored artefact, such as a report or presentation, intended for sharing within the broader community of teachers. This collaborative work can occur either synchronously or asynchronously, and participants are encouraged to maintain a reflective journal documenting their experiences.

Broadly speaking, the themes explored in the Virtual Environments (VEs) revolve around issues deemed crucial to teachers in rural or isolated settings, arising from their unique teaching contexts. Table 2.1 outlines the primary themes of the VALIANT exchanges, with a notable emphasis on foreign language education, reflecting the substantial participation from this educational domain.

Table 2.1: *Themes of the VALIANT Virtual Exchanges*

Teaching foreign languages online
Using gamification in foreign language teaching
Setting up a Virtual Exchange for your pupils
Diversity and inclusion in our classrooms
Learning during teaching practice
Diversity and inclusion in our primary classrooms
Integrating technologies in the foreign language classroom
Developing CLIL lessons and materials for primary and secondary classrooms
Defining professional spaces in different educational cultures
Innovation in foreign language education
Computational thinking in Spanish and Portuguese
Supporting teachers of Ukrainian refugees

Each of the VE models we created was led by facilitators, specifically university teachers, utilising video and text-based communication tools to foster co-learning among the participants. Initially, during the early stages of the VEs, these facilitators hailed from the member universities within the consortium. Nevertheless, in subsequent rounds, there were instances where teachers who had previously engaged in a VE were invited to join as collaborators.

The facilitators' role was to design the VE and its related tasks, organise plenary online meetings of all the participants and to lead reflective discussions of the interactions and collaborations taking place in the working groups. The facilitator was also responsible for identifying possible problems or misunderstandings which were arising and to try and resolve these through dialogue with the participants. Finally, the facilitator was also responsible for ensuring that participants who successfully completed the exchange received a certificate of participation.

Typically, each model extended over a span of 6–8 weeks, although some VEs had shorter durations. This timeframe is deemed necessary to afford participants the opportunity to adequately prepare for online sessions, engage in tasks, conduct background reading, and reflect on the outcomes of their collaborative efforts. Facilitators played a pivotal role in encouraging participant interaction that fosters reflection on the learning process.

The participants' roles as experts or non-experts were dynamic and contingent on their specific roles within the given context. For instance, in discussions pertaining to the conditions of teaching in rural schools, experienced teachers might assume the role of mentors or "educational experts" in specific sessions. Conversely, in topics related to digital technologies, student teachers could emerge as the "experts" in the exchange.

In the next section we outline the different steps involved in setting up and running a VALIANT exchange.

A Step-By-Step Description of the Virtual Exchange Process

The subsequent section provides a comprehensive step-by-step overview of how we structured our VE programmes, spanning from registration to completion:

1. Participants enrol in one of the offered VEs through the dedicated virtual platform established for the project (the VALIANT platform) and are assigned a suitable VE along with a collaborative working group.
2. Participants receive an introduction to the VE, along with an overview of various tasks and the overall objective of the specific exchange. They are then tasked with assignments, discussion topics, problems, or training materials that require preparation for their sessions. Additionally, they may be invited to propose a topic or problem from their own context for feedback and ideas.
3. Virtual collaboration sessions occur online, employing group-based videoconferencing technology and text-based asynchronous communication. Each model strives to incorporate 3 or 4 synchronous sessions within its 6–8-week duration, contingent upon feasibility in the participating areas.
4. Teams compile reports summarising their collaborations, encompassing elements such as lists of good practices, lesson plans, and guidelines for addressing common issues. Reflection, in the form of learning diaries or videos, is integral to all VEs.
5. Outcomes from the Virtual Innovation and Support Networks, such as teaching materials and compilations of good practices, are made accessible on the VALIANT platform for utilisation in subsequent exchanges, provided participants grant permission.
6. Teachers and student teachers are duly acknowledged with academic credit or some form of recognition – specifically, a certificate developed in consultation with relevant public authorities – for their successful participation in the Virtual Innovation and Support Networks.

Ensuring the Quality of Virtual Exchanges

To uphold the quality of each VE programme, we implemented a peer review system at various stages of the development process. In essence, every educator involved in shaping a VE theme also assumed the role of a reviewer for another theme. The objective was to act as a "friendly critical reader" for early drafts of different VE programmes. Beyond providing written feedback on the drafts, some researchers conducted online review meetings to deliberate on the contents of specific VEs. Emphasis was placed on two crucial aspects: ensuring clarity in descriptions regarding participants' expected workload and attendance during synchronous sessions, and defining the organization of participant groups in the specific exchange.

In the next section, we will share one example of a theme for each basic model. We have chosen to include themes that we know worked well

and that other educators and trainers may want to adapt to their own context or use as inspiration or a frame for a new theme.

A Typology of VALIANT Virtual Exchanges

We adopted a similar structure throughout the VE descriptions below, with recurring headings and similar layout. As described above, we organised three types of VEs:

1. *Teacher to Teacher* Virtual Exchange,
2. *Teacher and Student Teacher* Virtual Exchange, and
3. *Student to Student* Virtual Exchange *(student teachers working with student teachers*).

Below, we offer one example per type of VE. For each example, there is a short description of the VE and how it was organised, including information about tasks and learning aims. An outline of the VE then follows.

Teacher to Teacher Virtual Exchange

Example: Supporting teachers of Ukrainian refugees

Learning aims

- To develop knowledge of the specific needs of Ukrainian students.
- To draw up strategies for how to support their learning.
- To engage in collaboration with other teachers towards developing a resource worksheet.

Digital tools

- Video conferencing tool: Zoom
- Learning management platform: Moodle
- Google Drive (Google docs)

This VE brought together teachers from various European regions who were actively engaged with or gearing up to work with Ukrainian students affected by the war and displacement. Participants gleaned insights from expert speakers who delved into the unique requirements of Ukrainian

students and strategies for supporting their learning. The VE covered a spectrum of topics, including teaching advice from seasoned educators of Ukrainian students, guidance on trauma-informed teaching, exploration of the social and cultural context and needs of Ukrainian learners, and perspectives shared by Ukrainian scholars and teachers. Beyond the learning sessions, participants had the opportunity to collaborate, fostering a sense of community with colleagues across Europe. The aim was to establish an ongoing support network and facilitate the exchange of valuable resources even after the conclusion of the VE.

The duration of this VE was 6 weeks. Every week, there was a 1-hour synchronous video conference session (on a set weekday and time) and, in total, 14 hours of work for the participants. It would be possible to include up to 50 teachers in this type of VE, but we had fewer participants signing up (in total, 22), organised into 3 working groups. In each session (weeks 2–5), the participants listened to an online presentation by an expert on a particular theme related to working with students from Ukraine. Following the presentation, the participants had a chance to ask questions or to engage in group work in breakout sessions to strategise how to use this new knowledge to address the particular needs of Ukrainian students.

Tasks to Be Completed

Task 1: Introduction to the VE and getting to know each other, including becoming familiar with some basic ground rules of Virtual Support Networks (such as attendance and netiquette) and with the platform and tools for the exchange. Creating a profile in Moodle.
Task 2: Identifying a scenario/challenge to focus on during this VE (synchronously; group work).
Task 3: Exit slips (weeks 1–5).
Task 4: Developing a resource worksheet of strategies and solutions for addressing the chosen scenario/challenge (asynchronously or synchronously).

The resource worksheets created by each group were compiled into an eBooklet by the VE organisers, called *Supporting Teachers of Ukrainian Refugees: Resources for Responsive Teaching*. This is available on the VALIANT website.

Outline of VE

Stage	
1	"Getting to know you" phase. Teachers become familiar with the basic ground rules of Virtual Support Networks and with the platform and the tools for their exchange. They create their profile in Moodle. Participants participate in their first synchronous meeting (Task 1). They complete the exit slip (individually) (Task 3). They identify a scenario/challenge they want to work with (Task 2). Synchronous meeting: 60 minutes
2	Webinar, first expert speaker. Topic: "Multilingual approaches with newcomer students." A presentation on approaches and considerations for developing contextualised multilingual approaches in classrooms with Ukrainian refugee students. Participants discuss strategies that they learn and can apply to their context and in their group's scenario (Task 2). Exit slip (Task 3). Synchronous meeting: 60 minutes
3	Webinar, second expert speaker. Topic: "Universal Design for Learning (UDL) as a tool to create a safe and engaging learning environment." A presentation that equips the teachers with UDL practices and practical recommendations on how to enhance information perception and processing processes, increase students' motivation and help them stay resourceful. Participants discuss strategies that they learn and can apply to their context and in their group's scenario (Task 2). Exit slip (Task 3). Synchronous meeting: 60 minutes
4	Webinar, third expert speaker. Topic: "Five words a day: Building vocabulary knowledge with beginners." A presentation with concrete examples of the expert's own work to aid teachers and Ukrainian refugees in her local context. Participants discuss topics and strategies that can be applied to their respective local context and the specific group's scenario (Task 3). Exit slip (Task 2). Synchronous meeting: 60 minutes
5	Webinar, fourth expert speaker. Topic: "Teaching Ukrainian students through their voices". A presentation by three language teachers who share their experiences of teaching Ukrainian students. Participants attend a reflective presentation and discuss the incorporation of students' "voices" in their teaching/learning process. Exit slip (Task 2). Synchronous meeting: 60 minutes
6	Topic: "Reflecting, wrapping up, and looking ahead". Participants reflect on what they learned from this VE that they will use with future Ukrainian students (Task 4). They formulate plans for staying in touch and offering support and share their feedback on the VE. Synchronous meeting: 60 minutes

Teacher & Student Teacher Virtual Exchange

Example: Learning during teacher practice

Learning aims

For student teachers

- To explore teaching strategies that deal with challenging issues in the classroom.
- To receive just-in-time, practical teaching strategies and mentoring in response to these challenges.
- To co-author an Open Educational Resource (OER) in the format of an eBooklet.

For teachers

- To enhance their mentoring skills while working with student teachers.
- To collaborate with student teachers towards creating an OER in the format of an eBooklet.
- To discuss and share their co-authored OER with fellow teaching colleagues, external experts, policymakers, and ministry officials.

Digital tools

- Collaborative web platform: Padlet
- Video conferencing tool: Zoom
- Learning management platform: Moodle
- Google Drive (Google docs, Google slides, Google forms)

This VE aimed at connecting teachers with students of Initial Teacher Education who were completing their teaching practice (practicum). During the transnational mentoring sessions with teachers, the student teachers learned about strategies of classroom management and received just-in-time teaching and mentoring in response to challenges they faced in their practicum classes. Teachers had the opportunity to collaborate with student teachers towards working out solutions to common problems that arise in their classes.

Approximately 8–10 teachers of different subject areas from across Europe collaborated with 15–20 students from one participating institution in 3 working groups. The exchange included stages where the teachers and student teachers worked separately and others where they worked together.

The duration of this VE was 6 weeks, both for teachers and student teachers. There were 3 synchronous facilitated video conference sessions, and the number of "off-line" working hours was 20, both for teachers and student teachers.

Tasks to Be Completed

Task 1: Introduction to the VE and Building Connections: Teachers (mentors) and student teachers (mentees) familiarized themselves with the foundational principles of Virtual Support Networks, explored the exchange platform and tools, and established their profiles in Moodle. They engaged in their initial synchronous meeting, delving into introductory material on mentoring.

Task 2: Identifying Primary Challenges in Practicum: Student teachers, organised in groups based on their preferences for asynchronous or synchronous communication, discussed the primary challenges they encountered during their practicum. They utilised Padlet to post questions addressing these challenges, seeking mentoring from the teachers for the upcoming week.

Task 3: Teachers reviewed and discussed the student teachers' challenges on the Padlet within their respective groups. Subsequently, they responded to these challenges on the Padlet.

Task 4: Identifying Content for the Open Educational Resource (OER): Participants convened synchronously to discuss the Q&A from the prior stage and collaborated to craft an initial draft of their OER, specifically an eBooklet. This handbook outlined key challenges and strategies for new teachers, with decisions made regarding the organization and format.

Task 5: Participants, either asynchronously or synchronously in groups, dedicated efforts to creating the eBooklet and preparing for its launch. Each group focused on a chapter in the eBooklet and the corresponding segment of the eBooklet launch presentation.

Task 6: Participants hosted a live social event to launch the OER eBooklet, receiving feedback from peers, colleagues, experts, and stakeholders. Subsequently, they reflected on their Virtual Environment experience and conveyed farewell messages on Moodle.

Outline of VE

Stage	Class of 16 student teachers	7 Teachers
1	"Getting to know you" phase. Student teachers and teachers become familiar with the basic ground rules of Virtual Innovation and Support Networks, as well as with the tasks and tools for this exchange. They create their profile in Moodle and they explore initial introductory material regarding mentoring and mentee-ing. They also participate in their first synchronous meeting (Task 1). Mode: Asynchronously & Synchronously Duration: One week Synchronous meeting: 60 minutes	
2	Students collaborate in working groups: (1) They discuss (asynchronously or synchronously according to their preferences) the key challenges they are facing in their practicum. (2) They post questions on a Padlet regarding those challenges addressed to the teachers and expect mentoring from them in the following week (Task 2). Mode: Asynchronously and/or synchronously Duration: One week	
3		Teachers collaborate in working groups. (1) They read and discuss the student teachers' challenges on the Padlet. (2) They respond to those challenges on the Padlet (Task 3). Mode: Asynchronously and/or synchronously Duration: One week
4	Student teachers and teachers prepare for a synchronous meeting: (1) They meet synchronously to discuss the challenges of the previous stage. (2) They work together to create a first draft of their OER (eBooklet), which is a short handbook with key challenges and strategies for new teachers. (3) They decide the organization and the format of their eBooklet (Task 4). Mode: Asynchronously & synchronously Duration: One week Synchronous meeting: 90 minutes	

Stage	Class of 16 student teachers 7 Teachers
5	Student teachers and teachers work in groups (asynchronously or synchronously) towards creating the eBooklet and preparing for the eBooklet launch. Each group prepares one chapter in the eBooklet and the respective part of the eBooklet launch presentation (Task 5). Mode: Asynchronously and/or synchronously Duration: One week
6	Student teachers and teachers launch the OER eBooklet in a live social event and receive feedback from peers, colleagues, experts, and stakeholders (Task 6). They reflect on the VE and post a farewell message on Moodle. Mode: Synchronous Duration: One week Synchronous meeting: 60 minutes

Student to Student Virtual Exchange (Student Teachers Working with Student Teachers)

Example: Blended Intensive Program

Course objectives

- To learn about key issues related to innovation in foreign language education through online lectures and discussion of reading materials.
- To engage in task-based discussions with student teachers and teachers from various European countries around the theme of innovation in foreign language education across Europe.
- To develop classroom-based projects and learning materials based on the themes of the course.

Digital tools

- Collaborative web platform: Google Workspace
- Video conferencing tool: Zoom
- Learning management platform: Moodle

This VE brought together student teachers from across Europe who were studying Masters' degrees in Initial Teacher Education. Participants came

from MA courses in Finland, Germany, Ireland, Italy, Lithuania, and Spain who were preparing to become secondary school foreign language teachers in their respective countries. This project differed from other initiatives reported here as it was a Blended Mobility project which involved the strategic combination of both online collaboration and short-term physical mobility. To be precise, the project was organised as a Blended Intensive Programme (BIP) – a particular application of Blended Mobility which has been introduced in European Higher Education by the new Erasmus+ programme 2021–2027 (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2022). BIPs provide funding for European institutions to develop international courses between institutions coming from at least three countries which combine online collaborative activities (i.e., VE) and periods of short-term mobility in one of the participating countries.

This particular BIP combined online lectures by invited guest speakers with international online collaboration in working groups between student teachers and, finally, a week-long period at one of the participating institutions which involved the conclusion of project work and other events. The overall theme of the exchange was Innovation in Foreign Language Education.

In phase one, during the first four weeks of the project, participants were given online guest lectures by invited experts on themes such as Fandom in Foreign Language education, Open Education Resources for Foreign Language Education, Gamification in Foreign Language Education and Recent Developments in the *Common European Framework of Reference for Language Learning* (Council of Europe, 2020). Following each online lecture, students met in their international working groups and discussed the questions and prompts which had been provided to them in worksheets related to the themes of the lectures.

In the second phase of the project, each working group was asked to develop an innovative teaching project for classroom teaching inspired in some way by one of the guest lectures. Over a 3-week period, the working groups collaborated online on these projects. They received support by the course teachers in the form of presentations outlining the possible structure of the innovative teaching project as well as online tutorial meetings where feedback was provided.

Finally, in the third phase of the project, the students met on campus in Spain for a week of collaboration and cultural activities. Students attended

more guest lectures related to innovation in foreign language teaching, took part in cultural and social events and worked in their groups to finalise their projects. On the final day, the students presented their innovative teaching projects to the whole group and to their teachers and received feedback on their work.

Tasks to Be Completed

Task 1: Team formation (week 1)
All students meet online to see a presentation of the course. This is followed by break-out rooms where each working group meets and gets to know each other, using a series of prompts provided by the course tutors.

Task 2: Online lectures and group discussions (weeks 2–5)
Students listen to the online lectures, engage in discussion with the invited speaker and then, later that week, meet online in their working groups to complete the worksheet based on the guest lecture. Before each online lecture, students are also provided with a short article or set of online resources related to the topic which they should read beforehand.

Task 3: Online collaborative project work (weeks 6–8)
Students collaborate in their working groups to draw up an idea and first draft of their innovative teaching project for the foreign language classroom. They meet in videoconferencing sessions and use Google docs to write up their ideas.

Task 4: On-site collaboration (week 9)
Using the funds made available through the Erasmus+ programme for BIPs, students travel to one of the participating institutions and work together during a one-week intensive course. They take part in cultural and social activities to support team bonding and spend time each day finalising their projects. On the final day, these projects are presented to the whole group and students reflect on their whole experience.

Outline of VE

Stage	
1 Online	"Getting to know you" phase. Student teachers are introduced to the course and its structure. They also participate in their first synchronous meeting in their working groups (Task 1). Mode: Synchronous Duration: One week Synchronous meetings: 2 × 60 minutes
2 Online	Students listen to the online lectures, engage in discussion with the invited speaker and then, later that week, meet online in their working groups to complete the worksheet based on the guest lecture (Task 2). Mode: Synchronous and asynchronous Duration: Four weeks Asynchronous: Reading the materials related to the online guest lecture – 60 minutes approx. Synchronous meetings: 2 × 60 minutes each week (one in plenary session with guest lecture and one in working group).
3 Online	Students collaborate in their working groups to draw up an idea and first draft of their innovative teaching project for the foreign language classroom. They meet in videoconferencing sessions and use Google docs to write up their ideas (Task 3). Mode: Asynchronous and synchronous Duration: Three weeks Synchronous meetings: At least 1 60-minute meeting each week Asynchronous: Working on Google doc with the draft of the innovative teaching project
4 On-campus	Using the funds made available through the Erasmus+ programme for BIPs, students travel to X university and work together during a one-week intensive course. They take part in cultural and social activities to support team bonding and spend time each day finalising their projects. On the final day, these projects are presented to the whole group and students reflect on their whole experience (Task 4). Mode: On campus meetings Duration: One week

Conclusion – Good Practices When Running a Virtual Exchange

Based on our experience of setting up and running VEs as part of the VALIANT programme, certain principles of good practice can be identified which may be of use to other educators planning to run similar projects in the future. While no two VEs are ever the same, we believe that the following should be kept in mind when bringing student teachers and teachers into contact together.

- Provide participants with guidelines about what effective online intercultural collaboration involves.

Participants may not be familiar with what online collaboration with international colleagues may involve. Before the exchange begins, it can be helpful to establish principles of effective online behaviour and perhaps show some examples of interactions that led to misunderstandings in the past. In this regard, the work of Gutiérrez et al. (2021) can be very useful. These authors developed a mentoring handbook for teachers which offers materials and guidelines for VE instructors to use in their classes in order to raise students' awareness of good online collaborative practices before, during and after their VE experience.

- Ensure a balanced relationship between participants – where both student teachers and teachers have something to contribute to the interactions.

In VE it is important that all participants feel valued and that they are contributing to the topic under discussion. When designing the different tasks in an exchange, it is therefore important that all participants (whether they be teachers or student teachers) are given opportunities to use their expertise or experience to contribute to the successful conclusion of the project.

- Plan, in as much detail as possible, the different steps or stages which each task involves.

Especially when participants are new to VE and are unfamiliar with their partners, it is important that the different stages of their work are clearly

outlined from the beginning. This will provide participants with clarity about what should be done each week or in each meeting. Assigning roles in each working group (e.g., chairperson, secretary, technical operator) can also avoid confusion. These roles can be taken on by different working group members in each task.

- Ensure that the theme of the VE reflects the needs and concerns of the participants.

This is perhaps an obvious recommendation, but it is still one which should not be neglected. If teachers and student teachers are going to invest time in a VE, they need to be sure that the topics they are working on are of relevance for their work context or studies. Including participants in the choice of topics for their online collaborations is a good way to ensure this is achieved successfully.

- Be very clear about the expectations of participants and VE leaders/facilitators, respectively, as regards online communication and participation.

Similar to the importance of planning the different steps or stages of different tasks to add clarity for the participants, it is recommended that the expectations leaders/facilitators have of the participants and any expectations that the participants may have of their leaders/facilitator, are brought out in the open early on in a VE. It is helpful when both parties have the right expectations. Expectations can be shared and discussed as part of getting to know one another. Our experience is that when expectations are talked about (and not only "given" as part of written instructions), the risk of misunderstandings (or worse, feelings of disappointment about the course) is reduced.

- Offer accurate time estimates of what course participation entails.

It goes without saying that both teachers and student teachers are busy people and taking part in a VE is likely to take up much of their time. In order to avoid dropouts, VE organisers should be clear from the outset of how much time will be required to take part successfully in the VE each week. This will help participants make an evaluation about whether it is realistic for them to take part in the project. It will also help student

teachers work the VE into their study schedule. Setting clear deadlines for each task (or stage of each task) will also help participants to organise themselves.

- Keep in mind participants' foreign language levels.

The VALIANT exchanges all took place using a lingua franca – in other words, all participants used one common language to communicate together during the exchange. For most exchanges, the lingua franca was English, but Spanish and Portuguese were also used in one exchange. In any case, organisers should keep in mind that not all participants may be comfortable communicating in videoconferencing sessions in a foreign language with members of other cultures. This is often an issue with student teachers who may have little experience using the lingua franca outside of their language classroom. To support such participants, VE organisers can incorporate asynchronous text-based communication (e.g., email, discussion forums) into the VE, thereby giving participants more time to compose their ideas in the foreign language. Providing worksheets with key vocabulary about the topic of the task can also be helpful.

References

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

European Commission, Directorate-General for Education, Youth, Sport and Culture. (2022). *Blended mobility implementation guide for Erasmus+ higher education mobility KA131*. Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2766/467485

Gutiérrez, B., Reljanovic Glimäng, M., O'Dowd, R., & Sauro, S. (2021). *Mentoring handbook for Virtual Exchange teachers*. https://www.stevensinitiative.org/resource/mentoring-handbook-for-virtual-exchange-teachers/

Helm, F. (2016). Facilitated dialogue in online intercultural exchange. In R. O'Dowd & T. Lewis (Eds.), *Online intercultural exchange: Policy, pedagogy, practice* (pp. 150–172). Routledge.

O'Dowd, R. (2023). *Internationalising higher education and the role of Virtual Exchange*. Routledge.

Sundqvist, P., & O'Dowd, R. (2022). *The VALIANT Virtual Exchange manual*. https://valiantproject.eu/research-publications/

Euline Cutrim Schmid, Jekaterina Rogaten &
Margarita Vinagre

3. The research methodology of the VALIANT study

Introduction

This chapter delves into the methodology employed in the VALIANT research project, which aimed to assess the impact of Virtual Exchange (VE) on teachers and student teachers in European countries and regions. This chapter will outline the core research questions and objectives, data collection process and tools, and data analysis process. The detailed description in this chapter should enable the reader to better understand the setup of the experimental protocol and compare this approach with other similar large-scale projects. This will allow a better evaluation of the strengths and weaknesses of the VALIANT study and understand the research findings described in the following chapters. This section will also provide a detailed description of the surveys that were used to evaluate the VEs.

Project Aims and Research Questions

The overarching research question for the VALIANT project was to test the hypothesis that integrating VE programmes into teacher training programmes would provide the target groups (teachers in contexts of isolation and student teachers) with opportunities for innovation, collaboration, digital and intercultural competence development and career planning which would otherwise be difficult to access in rural areas or in times of enforced isolation, such as during the COVID-19 pandemic. We also aimed to establish whether the VE programmes we had developed made

the teaching profession more attractive to student teachers by engaging them in authentic learning and teaching scenarios.

The ability to interact and collaborate successfully in online networks is essential for educators as the COVID-19 pandemic highlighted, and current expectations of teachers and student teachers include the capability to collaborate in virtual classrooms. These online learning settings offer greater flexibility, easier access to resources, and a wider peer community than those in face-to-face settings; however, they also present some challenges that need to be addressed. Among the most often reported ones are feelings of professional isolation and lack of motivation.

Therefore, VALIANT focused specifically on VE as a way of mitigating participants' feelings of professional isolation and enhancing work motivation, self-efficacy, pedagogical development, intercultural and digital competencies, and transversal skills (i.e., time management, team working, negotiation and problem-solving). Therefore, our expectations for the VE programmes included a decrease in participants' feelings of isolation and an increase in the rest of the above-mentioned competences and skills. Other anticipated outcomes were that the VE participants would exhibit understanding of the topics covered in their training modules and express an interest in incorporating virtual communities of practice into their future professional teaching careers. We also expected the student teachers to report that their involvement in the VE programme made the teaching profession more appealing to them.

Specifically, the VALIANT project has five overarching objectives that informed the design of the VEs and ways of assessing their effectiveness:

(1) To overcome teachers' sense of isolation and to improve levels of motivation and self-efficacy through the networking and collaboration opportunities which emerge from participation in the VE programmes (Study on Policy Measures to improve the Attractiveness of the Teaching Profession in Europe Volume 2, 2013).

(2) To develop teachers' intercultural collaboration skills, transversal skills, as well as their ability to participate in online collaborative projects and networks (i.e., eTwinning, Erasmus+ KA2 proposals) which are essential for teaching in the modern European classroom (Thematic Working Group "Teacher Professional Development", 2013, p. 7)

(3) To develop teachers' ability to use digital technologies for professional engagement including professional collaboration, reflective practice and digital continuous professional development (see the DigCompEdu model of teachers' digital competences).

(4) To raise the awareness of students of Initial Teacher Education of the realities of the teaching profession through online collaboration with in-service teachers across Europe (Study on Policy Measures to improve the Attractiveness of the Teaching Profession in Europe Volume 2, 2013).
(5) To provide practicing teachers and students of Initial Teacher Education with resources, support, and strategies for career path planning in order maintain interest and engagement in the profession and empowerment in navigating their careers.

Each of the following chapters will explore how VE affected each of these aspects, present results and discuss findings in detail.

Researching Virtual Exchange in Educational Contexts

As discussed in previous chapters, the last few decades have seen a surge in research focused on understanding the effectiveness and potential benefits of VE in various educational contexts. Notable projects in this area include EVALUATE and EVOLVE, each concentrating on different aspects of VE. For example, EVALUATE (The EVALUATE Group, 2019) assessed the impact of VE on initial teacher education, while EVOLVE (EVOLVE Project Team, 2020) examined the effects of VE on student learning in higher education in general. In contrast, the VALIANT project aimed to assess the impact on both teachers and student teachers, making it unique by including collaboration between these two populations as a key component of the research. Additionally, VALIANT investigated three types of VE exchanges: VE programmes involving only teachers, VE programmes involving teachers & student teachers, and VE programmes involving only student teachers.

The research methodology used in the VALIANT project shares similarities with the methods employed in the aforementioned studies. Like VALIANT, these projects used a mixed methods approach, incorporating both quantitative and qualitative data collection and analysis. For example, the EVALUATE project utilised pre-post-VE questionnaire designs with a control group, and data collection tools included validated questionnaires, closed and open-ended questions, and qualitative interviews to measure the development of intercultural competence, digital-pedagogical

competences, and foreign language competence. Similarly, the EVOLVE project also adopted a mixed methods approach, employing pre- and post-VE questionnaires, student portfolios, and post-hoc interviews with students to investigate development in the areas such as intercultural competence, disciplinary competence, critical digital literacy, and language skills.

Overall, while the methodologies used in these projects share some core similarities with VALIANT in employing mixed methods and gathering data from pre-post tests and interviews, they also show some variations in terms of research sample, specific data collection tools, and analysis techniques. For instance, the number of experimentation rounds varied, with EVALUATE having two rounds of experimentation and VALIANT conducting three rounds. As it will be seen in subsequent sections, the VALIANT project built its methodological approach on the best practice identified in previous large-scale VE projects. This approach enabled VALIANT to gather additional insights to further expand the knowledge about the impact of VE in educational contexts.

In the following sections, a detailed explanation of the VALIANT methodology will be provided. This will give readers a comprehensive understanding of the research design and data collection procedures employed in the project.

The Experimentation Methodology

The ethical clearance for this project was obtained from the London College of Fashion (LCF) College Research Committee (LCF CRC) and it fully complied with the EU ethics regulation on research with human participants and personal data management. LCF was not involved in the delivery of the VE programmes and was an independent partner of the project who participated in the research ethics process, data collection and data analysis, which reduced research biases.

The research study employed an experimental approach to examine the effectiveness of the VALIANT VE programme. The process of evaluating models of VE is complex and various issues need to be addressed

when choosing a research methodology. For this reason, the research team followed the Commission's recommendations in the Guidelines for Conducting a European Policy Experiment (J-Pal Europe, 2016) and, as mentioned earlier, used a mixed methods approach (Dörnyei, 2007; Nunan & Bailey, 2009).

The study collected pre-post VE data at three distinct stages (i.e., in the pre, mid, and post VE surveys in each of the three rounds on VEs). At each stage, both qualitative and quantitative data were collected. The quantitative data from this pre-post VE experimental approach allowed the research team to examine the causal effect of the intervention on feelings of isolation, motivation, self-efficacy, intercultural competencies and transversal skills. Quantitative pre-post VE data were triangulated with the qualitative data (answers to the open ended questions in the pre, mid and post VE surveys) in addition to participants' interviews to provide a comprehensive insight into the outcomes of the experimentation. In addition, this study had a control group of 20 student teachers who completed the pre and post-VE survey but did not take part in the VE. Figure 3.1 below illustrates the process of data collection.

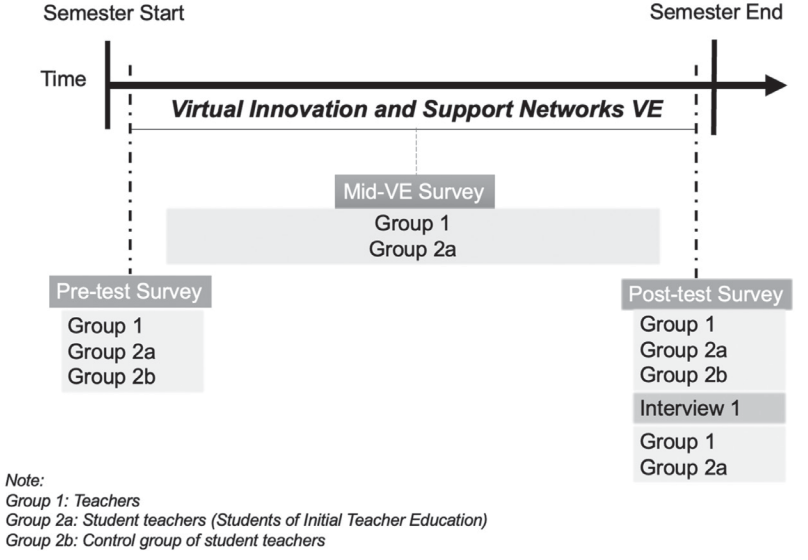

Figure 3.1: Data collection process

The first set of pilot VEs (round 1) was implemented in the autumn semester of 2021. Quantitative and qualitative data collection took place at the beginning, middle and end of the VEs although the control group only completed pre- and post-VE surveys. A preliminary analysis of the data gathered allowed the developers to fine tune the specific VE models on the basis of the feedback gathered, so that they could be improved for implementation in the subsequent semesters with new groups of participants.

Further quantitative and qualitative data were gathered in two field trials (rounds 2 & 3) in the spring semester of 2022 and autumn semester of 2022, which followed the same procedure as in Round 1. During the time frame of the project, a total of 24 VE Programmes were implemented (7 in round 1; 10 in round 2; 7 in round 3) of which 23 were conducted in English and 1 was conducted in Spanish and Portuguese.

Research Participants

Over 1000 teachers and student teachers expressed their interest in taking part in the VE. The primary composition of the sample population consisted of individuals from European countries or regions where the project team members were located. Nevertheless, invitations to participate in the project were also extended to institutions in other countries such as the USA and Brazil. Control groups of student teachers were recruited by two project partners. Participants in the control groups in the first and second round of VEs were given the opportunity to participate in the subsequent rounds of the VEs if interested. Participation in the VE and completion of surveys were all voluntary. No teachers or student teachers were "obliged" to participate and all were given the possibility to opt out. A form of consent was used to request permission from participants for data collection purposes.

In total, 688 participants took part in the VALIANT VEs. Since completion of all the surveys was voluntary, complete data was collected from 460 participants. The final sample also includes the control group of 20 student teachers that completed the pre-VE surveys and post-VE surveys in Rounds 1 and 2. Table 3.1 below presents the summary of VE completers (participants who completed all the surveys) organised by their current occupation for each round of exchanges.

Table 3.1. Participants' profile

		N	%
Autumn 2021	Teachers	81	50
	Student Teachers	81	50
	Total	162	100
Spring 2022	Teachers	51	33.6
	Student Teachers	101	66.4
	Total	152	100
Autumn 2022	Teachers	51	34.9
	Student Teachers	95	65.1
	Total	146	100
Overall	Teachers	183	39.8
	Student Teacher	277	60.2
	Total	460	100

In relation to the country, the majority of the teachers were from Spain (26.9 %), Slovenia (15.1 %), Portugal (14 %), Germany (12.4 %), Turkey (10.8 %), and the rest were from other European countries as well as USA, Brazil, China, Algeria (20.8 %). Most student teachers were from Germany (35 %), Turkey (29.9 %), Spain (17.2 %) and Sweden (5.1 %). The remaining participants were from various European countries, as well as USA, Brazil, and Argentina (12.8 %).

Most of the participants identified as female (87 % teachers; 71 % student teachers) and 1.3 % participants identified as non-binary and gender fluid. The average age of teachers was M=40.46 (SD=10.9) and of student teachers was M=23.46 (SD=4.5). Teachers had on average M=14.69 (SD=9.95) years of teaching experience with the maximum of 38 years.

To better understand the work environment of teachers and if they had a supportive professional community, we asked participants to indicate how isolated they felt in their workplace. In terms of self-identification as feeling isolated in work (i.e., "Would you describe yourself as working in isolation in some way?"), 66.1 % of teachers answered "no", 25.1 % answered "somewhat" and 8.2 % answered "yes". We also asked participants if they were working in rural or urban areas. Overall, 69.8 % of

teachers reported working in rural or somewhat rural areas and 30.1 % did not consider their workplace as being rural.

Similarly, we asked the same questions to student teachers in relation to their study environment. Most student teachers did not identify as feeling isolated in their studies. Many of them stated that they did not feel isolated (76.7 %), felt somewhat isolated (14.8 %) and only a small percentage felt isolated (7 %). Most student teachers (70 %) also had some teaching experience (internship) and out of them 69.4 % reported that the internship took place in rural or somewhat rural areas. However, the majority stated they did not feel isolated (51 %) during their internship. Despite these results, some reported feeling at least some level of isolation (27.2 %). The remaining 21.8 % did not answer the question.

Quantitative Data Collection Tools and Instruments

As already mentioned above, the main tool for data collection was a survey which comprised a series of closed ended items that had already been validated in previous studies but that were adapted for their use in the VALIANT project. The surveys with all adapted versions of the items were pilot tested prior to their use in the project. The pre- and post-VE surveys were identical for measuring self-reported levels of isolation, motivation, self-efficacy, digital competence and attitude, transversal skills and intercultural competences. The isolation and motivation items were adapted to the context of student teachers and teachers (i.e., context of studying or context of work), and self-efficacy was only measured for teachers. All the other items remained the same for all participants. The post-VE survey also included 5 questions relating to the satisfaction with the VE experience. The survey was in English and participants overall rated it easy to understand (85.47 % average rating for easiness) and for this reason they did not think it was essential for them to complete it in their own language (17.04 % average rating for essentiality of translation). In addition, participants also answered a series of open-ended questions included in the pre-, mid- and post-VE surveys relating to the areas already mentioned above. This allowed the researchers to gather qualitative data. These questions were also in English, but participants could write the answers in their preferred language. The surveys will be described in detail below. The full survey can be accessed online on the VALIANT website https://valiantproject.eu/

Motivation in the pre- and post-VE surveys was measured using the Multidimensional Work Motivation Scale (MWMS; Gagné et al., 2015). The items were adapted to participants' profiles and therefore they focussed on either work (for teachers) or study (student teachers). The first version of the survey consisted of 15 questions that measured intrinsic regulation/motivation, identified regulation, introjected regulation, external regulation and amotivation. Responses were recorded on a 0 (not at all) to 100 (completely) scale. After Round 1 of the exchange, the questions that lacked reliability (Cronbach' s alpha <0.7 in either teachers or student teachers' samples) were removed resulting in the three final domains that were measured in the study and analysed i.e., intrinsic regulation (Cronbach's a >0.84), identified regulation (Cronbach's a >0.83), and external regulation (Cronbach's a >0.75).

Isolation was measured across a number of domains such as physical isolation and informational isolation (Workplace Social Isolation scale; Orhan et al., 2016), social isolation (Social and Emotional Loneliness Scale for Adults, SELSA; DiTommaso & Spinner, 1993) and emotional isolation (SELSA-S scale; DiTomaso et al., 2004). All the items in the scale were adapted to the participants' professional environment (study for student teachers or work for teachers) and responses were recorded on a scale from 0 (strongly disagree) to 100 (strongly agree). The overall measure of professional isolation was computed by aggregating all the items across three dimensions of isolation to assess overall levels of isolation. The items showed good reliability across all three rounds of data collection (Cronbach's a >0.75).

After the analysis of the qualitative open-ended questions collected during VALIANT Rounds 1 and 2, it became apparent that the measure of overall isolation described above did not adequately capture the gains participants made in their ability to connect with people and expand their professional network as a result of VE participation. These gains however, seemed to be important in mitigating professional isolation. Thus, we summarised these changes in a VE Impact on Isolation survey that consisted of 10 statements and assessed participants' beliefs about the benefits of the VE for building supportive professional community/connections. The items asked participants about whether VE helped them to feel part of the teaching/student community, feel connected with other teachers/students, have good professional support, have better interactions with colleagues, and value current work/study conditions. This new survey was only used

in Round 3 of the VALIANT data collection process. The responses were recorded on a scale from 0 (strongly disagree) to 100 (strongly agree) and the scale showed excellent reliability (Cronbach's a >0.9).

Intercultural competence was measured across 4 dimensions. The cross-cultural collaboration items were taken from the Stevens Initiative (2020) collection of VE survey items. Items on verbal and non-verbal behaviours were taken from the Cultural Intelligence Scale (CQS; Ang et al., 2007); Finally, items relating to perspective-taking and interest in learning about cultures were taken from the PISA Global Competence questionnaire (OECD, 2018). The survey overall included 19 items and responses were recorded on a scale from 0 (strongly disagree) to 100 (strongly agree). Each of the measured skills was computed by averaging out the scores of their respective items. The reliability for each of these 4 domains was very high and therefore, item reduction was done for the survey used in Round 3. The shortened survey consisted of 13 items and showed very high reliability (Cronbach's a>0.81).

Digital competences and attitudes for online collaboration were assessed using modified items from the DigCompEdu Framework for Citizens 2.1 (Carretero Gomez et al., 2017). Initially 5 questions were used to measure digital competence and 5 to measure digital attitudes. The responses were recorded on a scale from 0 (strongly disagree) to 100 (strongly agree). The reliability of the survey in Rounds 1 and 2 was very high and therefore item reduction was possible. In Round 3 of data collection a shorter version of the survey was used with 3 questions measuring competence and 3 questions measuring attitude. The reliability of the shortened survey was high (Cronbach's a >0.78).

Self-efficacy was measured using items from selected domains from two validated questionnaires. Efficacy to influence decision making, efficacy to enlist community involvement, and efficacy to create a positive school climate were adapted from the Teacher Self-efficacy Scale (Bandura, 2006). In addition, self-efficacy in instructional strategies and self-efficacy for student engagement were taken from the Teachers' Sense of Self-Efficacy Scale (TSES; Klassen et al., 2009). The survey was only given to teachers and responses were recorded on a scale from 0 (not at all) to 100 (a lot). The overall levels of professional self-efficacy were calculated by averaging all the items in this survey which showed excellent reliability (Cronbach's a >.88).

Transversal skills were measured using two existing questionnaires. Items relating to teamwork and negotiation skills were taken from the eLene4work self-assessment tool (2021) and adapted to a context of work or study. Items relating to time management and problem-solving were taken from the Model of Soft Skills Assessment tool (MOSSA; Ducange et al., 2016) and were also modified to the previously mentioned contexts. The survey overall consisted of 11 items and responses were recorded on a scale from 0 (strongly disagree) to 100 (strongly agree). Each of the measured skills were computed by averaging out the scores for their respective items. The reliability for each of the domains was very high (Cronbach's a>0.81). In addition, one item was added to this scale to test whether participants were answering questions meaningfully (i.e., "When answering this question, please draw the slider to forty for validation of answers").

Qualitative Data Collection Tools and Instruments

The qualitative data for this study were collected through open-ended questions at three different times: before, during, and after the VE. The pre-survey and post-survey included open-ended and close-ended questions whereas the mid-VE survey only contained open-ended questions that were sent to the participants half-way through the VE.

The pre-VE survey had four open-ended questions, which prompted participants to write about their motivations and expectations regarding the VE. These questions aimed to gather insights into participants' initial thoughts and hopes regarding the experience. The mid-VE survey consisted of six open-ended questions that encouraged participants to reflect on their VE experience, including their learning outcomes and how these experiences had influenced their current work or study environment. These questions sought to delve deeper into participants' perceptions and observations during the mid-VE phase. Finally, the post-VE survey included seven open-ended questions. Participants were asked to reflect on their overall experience, including what they had learned and the impact of the VE in their work or study. These questions aimed to capture participants' final impressions and the lasting effects of their engagement in the VEs. By utilising these open-ended questions alongside the quantitative survey, the researchers obtained a comprehensive understanding of participants'

perspectives and experiences, enabling a layered and richer analysis of the data to assess the impact of the VALIANT project.

In addition to the open-ended survey questions, other qualitative data were collected through interviews, recordings of some sessions, portfolios and self-reflection videos. After consent was granted by participants, data collected with these instruments were anonymised in order to comply with GDPR regulations and data analysis and discussion of findings have been included in the case studies section in the book.

Data Analysis

Quantitative Data Analysis

The quantitative data analysis was conducted using SPSS. The pre-, mid-, and post-VE surveys from each VE from across three rounds of exchanges were compiled together into one dataset. The participants were anonymised and all incomplete data cases and participants who had responded incorrectly to the test questions were removed prior to the analysis. The study variables were computed and the reliability for the surveys and their subscales tested using Cronbach's alpha. The data was scanned for outliers (there were no extreme cases) and variables' distribution was examined. The majority of the variables were not normally distributed and therefore, non-parametric (distribution-free tests) that make no assumption about the distribution of the data were used to test the research hypotheses (i.e., that integrating VE programmes into teacher training will enhance teachers' and student teachers' intrinsic motivation, digital competences, transversal skills and intercultural competences, and teachers' self-efficacy, as well as reduce feelings of isolation). This decision was made because there is little difference in the power and robustness of the tests when sample size is large. Both parametric and non-parametric tests provide reliable results. However, using non-parametric tests protects us from inaccurate overestimation of the findings when we look at how the change happens in different VE types, VE rounds and separately for teachers and student teachers samples. Thus, in the large samples (i.e., like the one in this study)

non-parametric tests are powerful in detecting both statistically and practically significant changes. Descriptive statistics (Median, Means and SD as well as graphical representations of the data) was used to explore the dataset and get the general understanding of the data as well as demonstrate observed patterns. Finally, Inferential statistics (i.e., Wilcoxon Sign-Rank Test) was used to test the above-mentioned research hypotheses.

Qualitative Data Analysis

For the analysis of the qualitative data, codebooks were created that included the frameworks for analysis of the different variables. These were based on theoretical frameworks already tested and validated for each of the variables as explained in the section titled "Quantitative Data Collection Tools and Instruments" above. The only exception to this were the variables of isolation, pedagogical development and self-efficacy, since not one specific theoretical framework was found and therefore researchers had to develop their own framework for data analysis. These codebooks, with their comprehensive list of codes and their corresponding definitions were then introduced in NVivo and MAXQDA in the form of nodes, and other new categories (nodes) were added to code all data observed. These categories included:

- Other learning or achievements: When participants reported other learning gains that were not mentioned in the specific framework of analysis
- General comments: When participants made comments describing their overall experiences in the VE
- Denying any learning: When participants reported that they had learned nothing new
- Suggestions: When participants put forward ideas for improving the experience and learning in VE
- Problems: When participants reported problems or challenges they faced during their participation in the VE
- Uncertain: When coders were uncertain about where they should code a unit of data. In this case coders held discussions and either coded the segments into the existing codes or created new ones.

When analysing the qualitative data, researchers took approaches which had elements of both thematic analysis (Braun & Clarke, 2022) and content analysis (Hsieh & Shannon, 2005). These methods encompassed the development of themes derived from the identification of codes and sub-codes in codebooks which are presented in each individual chapter within this book. The frequency of codes was collected in the codebooks – something which is more common to a qualitative content analysis approach. While frequency of occurrence is not necessarily always considered an indicator of significance in qualitative coding (Saldana, 2013), it is nevertheless a common tool in many approaches to qualitative analysis and Weber (1990) argues that high quality content analysis uses both quantitative and qualitative analysis of texts.

Most areas under study used a deductive approach, employing codes based on existing frameworks (e.g., frameworks relating to motivation, digital competence, intercultural competence). However, when no previous theoretical framework was known in the area under research that could help code and analyse the qualitative data (e.g., isolation, self-efficacy), the researchers had to first look at the collected data in order to inductively develop codes and sub-codes that would underpin the qualitative analysis.

To ensure reliability of coding, one researcher coded all data and a second researcher coded 20 % of all data in each of the rounds. Regular meetings were held between the coders to ensure that nodes and descriptions together with examples of coding were agreed upon by both coders. Percentage of reliability was ≥80 for all variables. Following Braun and Clarke (2022), the use of testing reliability aimed to mitigate biased results that could arise from the subjectivity of a single coder.

Monitoring and Quality Control Measures

Peer Evaluation

To maintain a thorough and meticulous approach towards quality control in the various stages of design, data gathering, and data analysis, the project coordinator took the initiative to appoint an external peer reviewer.

This reviewer played a crucial role in ensuring that the project adhered to rigorous standards. In addition, the academic members involved in the research process actively engaged in reviewing each other's work as well as the work of other collaborators during the data collection and analysis phases. This comprehensive review process encompassed both statistical analysis and the coding of qualitative data.

Moreover, the research team evaluated and refined the data gathering tools and methods after each phase of collection and analysis. This iterative approach allowed the team to identify any potential shortcomings or areas for improvement and to optimise the effectiveness and efficiency of the data collection tools for subsequent rounds.

Intellectual Property Rights

In order to maximise impact in terms of the number of people who will be positively affected by the experiment and to ensure the sustainability of this impact, all the project outputs (tools, best practices, materials, co-authored artefacts) have been produced as Open Educational Resources (OERs) and Open Educational Practices (OEPs). Using OERs and OEPs will contribute to the long-term follow-up of the project after its completion and to the up-scaling of its results through peer-learning at a European level. This is in line with the project's goals towards the professional development of teachers, not only for the ones who were recruited for the purposes of VALIANT, but also for a bigger number of teachers who will be able to reuse the project's outputs.

Conclusion

In this chapter, the VALIANT project's research methodology was presented. The chapter outlined the core research questions and objectives of the project, as well as the data collection and analysis processes. The project adopted an experimental approach with three types of VE exchanges and utilised a mixed methods approach, collecting both qualitative and quantitative data from over 400 participants.

The subsequent chapters will delve into detailed results for each of the variables, exploring the impact of VE on teachers and student teachers, and highlighting the strengths and weaknesses of the VALIANT research project. The findings are expected to provide valuable insights for enhancing teacher training and professional development, especially in the context of online collaboration.

References

Ang, S., Van Dyne, L., Koh, C., Yee Ng, K., Templer, K. J., Tay, C., & Chandrasekar, N. A. (2007). Cultural intelligence: Its measurement and effects on cultural judgment and decision making, cultural adaptation and task performance. *Management and Organization Review, 3*(3), 335–371.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (Vol. 5, pp. 307–337). Greenwich, CT: Information Age Publishing.

Braun, V., & Clarke, V. (2022). *Thematic analysis. A practical guide*. Los Angeles, London, New Delhi, Singapore, Washington, DC, Melbourne: SAGE.

Carretero Gomez, S., Vuorikari, R., & Punie, Y. (2017). DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use. Luxembourg: Publications Office of the European Union. https://doi.org/10.2760/38842 (online).

DiTommaso, E., & Spinner, B. (1993). The development and initial validation of the Social and Emotional Loneliness Scale for Adults (SELSA). *Personality and Individual Differences*, *14*(1), 127–134. https://doi.org/10.1016/0191-8869(93)90182-3

Dörnyei, Z. (2007). *Research methods in applied linguistics.* Oxford University Press.

Ducange, C., Prunotto, F., Gaffuri, P., Genova, T., Dimitrova, K., Simeonova, G., Dall'Amico, E., & Carrollaggi, P. (2016). MOSSA: The model of soft skills assessment. VHSM CONSORTIUM. Retrieved from http://valorize.odl.org/outputs/IO2%20-%20MOSSA%20VHSM.pdf

eLene4work. (2021). *Self-evaluation tool for the assessment of students' soft skills and soft skills 2.0.* http://sa.elene4work.eu/selfassessment.php

EVOLVE Project Team. (2020). The impact of Virtual Exchange on student learning in higher education: EVOLVE Project Report. https://hdl.handle.net/11370/d69d9923-8a9c-4b37-91c6-326ebbd14f17.

Gagné, M., Forest, J., Vansteenkiste, M., Crevier-Braud, L., Van den Broeck, A., Aspeli, A. K., Bellerose, J., Benabou, C., Chemolli, E., Güntert, S. T., Halvari, H., Indiyastuti, D. L., Johnson, P. A., Molstad, M. H., Naudin, M., Ndao, A., Olafsen, A. H., Roussel, P., Wang, Z., & Westbye, C. (2015). *Multidimensional work motivation scale* (MWMS) [Database record]. APA PsycTests. https://doi.org/10.1037/t45942-000

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative health research, 15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

J-Pal Europe. (2016). *Social experimentation: A methodological guide for policy makers.* http://www.poatgioventu.it/images/documenti_poat/nuova_programmazione/WroclawGuide_to_Social_Experimentation.pdf

Klassen, R. M., Bong, M., Usher, E. L., Har Chong, W., Huan, V. S., Wong, I. Y. F., & Georgiou, T. (2009). Exploring the validity of a teachers' self-efficacy scale in five countries. *Contemporary Educational Psychology*, *34*(1), 67–76.

Nunan, D., & Bailey, K. M. (2009). *Exploring second language classroom research: A comprehensive guide.* Heinle: Cengage Learning.

OECD. (2018). Questions related to global competence in the student questionnaire. https://www.oecd.org/pisa/PISA-2018-Global-Competence-Questionnaire.pdf

Orhan, M. A., Rijsman, J. B., & van Dijk, G. M. (2016). Invisible, therefore isolated: Comparative effects of team virtuality with task virtuality on workplace isolation and work outcomes. *Revista de Psicología del Trabajo y de las Organizaciones*, *32*(2), 109–122.

Saldana, J. (2013). *The coding manual for qualitative researchers* (2nd ed.). London: Sage.

Stevens Initiative. (2020). *Evaluating VE*. https://www.stevensinitiative.org/wp-Content/uploads/2020/07/Evaluating-VE-Toolkit-Appendix-updated-july-2020.pdf

The EVALUATE Group. (2019). Evaluating the impact of VE on initial teacher education: A European Policy Experiment. https://doi.org/10.14705/rpnet.2019.29.9782490057337.

Weber, R. P. (1990). *Basic content analysis*. London: Sage Publications.

Maria-Victoria Soulé, Savvi Antoniou, Maria Christoforou & Jekaterina Rogaten

4. Impact of Virtual Exchange on teachers' and student teachers' motivation levels

Introduction

Motivation is a crucial factor in all aspects of a teacher's life, starting from the decision to pursue the profession to performing at their best within the classroom. Teachers often highlight various factors that influence their motivation, such as "fair promotion system, adequate resources, an excellent working environment, incentives, income, job security, pleasure at work, training, and development, good organizational guidelines, and performance appraisal" (Kumari & Kumar, 2023, p. 9). According to Dörnyei and Ushioda (2001), it is essential to distinguish between two aspects of teacher motivation: the motivation to teach and the motivation to sustain a career in the profession. The factors affecting motivation to teach can differ between individuals at different stages of their teaching careers. In their comprehensive review of teacher motivation studies, Han and Yin (2016) highlight that personal characteristics, social and cultural context, intrinsic values (such as perceptions, expectations, responsibilities and concerns about teaching) and extrinsic values (such as social status, job security, job transferability and time for family) are the main factors that trigger student teachers' motivation to teach. For teachers, the authors emphasise the significance of various factors, including teacher autonomy, professional input, professional development, professional relations and ties, and the working environment that encompasses leadership, working relationships and institutional support. They also highlight the importance of intrinsic values like self-evaluation and intellectual stimulation, and extrinsic values such as financial benefits, family and community influence, and the convenience and benefits of teaching. In addition, Han and Yin (2016) report on some challenges or demotivating factors, including stress,

administration, inadequate career structures and teaching repetitiveness. They discuss the lack of teacher autonomy, particularly in relation to insufficient self-efficacy, and emphasise the significance of extrinsic values like low salaries and limited research opportunities. Furthermore, the authors address the impact of students' attitudes and behaviours as demotivating factors that affect teachers' motivation, hindering the sustainability of a career in the profession.

The declining appeal of the teaching profession in recent decades suggests that these aspects might have been overlooked or disregarded (Shikalepo, 2020). The importance of motivating teachers cannot be overstated as it has a direct impact on learner performance, which in turn affects the quality of education provided to learners. Consequently, motivating teachers is vital to boost their self-confidence, thereby facilitating exceptional learner performance. It is noteworthy that inadequately motivated teachers tend to result in low levels of learner achievement. In this context, Virtual Exchange (VE) emerges as a promising approach to address this issue as it offers opportunities for collaborative learning, cross- cultural understanding and enhanced teacher- student engagement.

The present study delves into the examination of motivation, focussing specifically on the perspectives of teachers and student teachers., and adopts the Self-determination Theory (SDT) (Ryan & Deci, 2000) as its theoretical framework for the analysis. Even though quantitative analysis failed to show statistically significant increase in the motivation levels of teachers and student teachers, the study presents in-depth results from a qualitative analysis, offering valuable insights into their motivation levels when participating in VEs in the VALIANT (Virtual Innovation and Support Network) project. The study shows which aspects they found to be more motivating and those which were less successful at maintaining their motivation levels.

Self-Determination Theory

Self-Determination Theory (SDT) focuses on people's personality, inherent growth tendencies and innate psychological needs (Ryan & Deci, 2000) on the psychological rather than on the sociological or physiological

levels. It is also a theory of human motivation interested in examining phenomena across various factors, such as gender, culture, people's age and socioeconomic status (Deci & Ryan, 2015). SDT identifies what stirs people into action and how they behave in various domains of their lives. The theory has undergone many revisions throughout the decades, and the present chapter focuses on Ryan and Deci's (2000) review of the theory. The three levels of motivation that are analysed vary from high to low self-determination and are (a) *intrinsic motivation*, (b) *extrinsic motivation* and (c) *amotivation*. When *intrinsically motivated*, a person is inwardly moved to do something out of inherent enjoyment, or as a source of satisfaction. *Extrinsic motivation* involves a separable outcome and is driven by external rewards. Finally, *amotivation* refers to having neither internal nor external motivation to engage in a specific activity, accompanied by lack of purpose or volitional drive to perform it.

Ryan and Deci (2000) further elaborate on different levels of motivation according to its relative autonomy. They further propose that at the far left of the *extrinsic motivation* continuum, resides the most autonomous form which is called *integrated regulation*. Integration occurs when people have evaluated and accepted the cause of action according to their own values and needs. It is an externally motivated action since people's motivation for their behaviour relates to a separate outcome apart from their own reward or inherent enjoyment. For example, exercising and being physically active becomes consistent with one's beliefs about maintaining a healthy lifestyle.

The second most autonomous form of extrinsic motivation is *identified regulation*, which means that people consciously value a goal based on what is personally important to them. An example of identified regulation is when students study very hard to pass their university-entrance exams because studying at a university is a goal they have set for themselves and for their future.

Introjected regulation is the next form of extrinsic motivation through which people may be internalising regulation but not fully taking responsibility for it. They may behave in a certain way to avoid anxiety or guilt and to find a way to enhance their pride. An example of *introjected regulation* by Ryan and Deci (2000) is when people feel motivated to show their abilities to ensure they still feel worthy. Finally, the least autonomous form of extrinsic motivation is referred to as *external regulation*, involves behaviour driven by external rewards (tangible or not) or the satisfaction

of certain demands. Students who study hard to get good grades to receive a material reward from their parents is an example of external motivation. Figure 4.1 illustrates the motivation continuum.

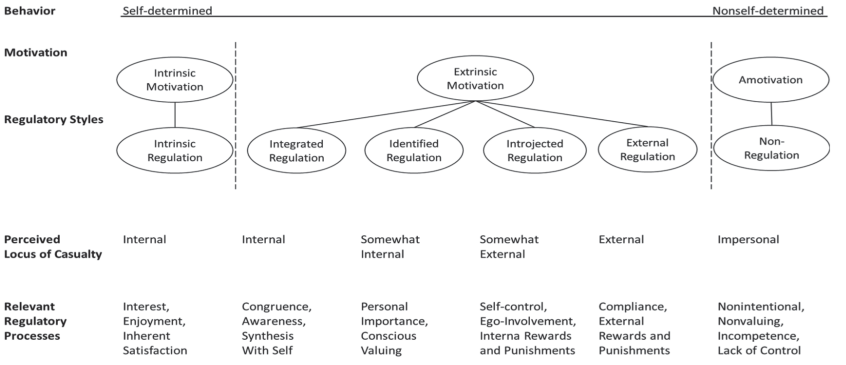

Figure 4.1: The self-Determination Continuum (Adapted from Ryan and Deci, 2000, p. 72)

Within the realm of education, Fernet et al. (2008) undertook a study that sought to apply the SDT by developing the Work Tasks Motivation Scale for Teachers (WTMST), a measure of teachers' motivation towards specific tasks. According to the authors, teachers' motivational processes may vary towards the tasks they perform.

Motivation in Virtual Exchange

Although the impact of motivating teachers and student teachers to deliver quality education to learners is essential, there is a lack of research examining the motivation levels of teachers and student teachers together when it comes to their VE participation.

When it comes to different motivation levels recorded in VE projects, Demir and Kayaoğlu (2021) referred to mixed motivation levels among students and teachers in an eTwinning VE project. Specifically, the

project provided the students with real-world experiences that increased their motivation, engagement and enjoyment. On the other hand, the lack of coordination and collaboration with the partner teacher abroad caused a teacher to experience reduced motivation levels. In another study, various factors such as the students' different expectations for the project, their differences in motivation and use of time, and other social and institutional factors leads to caused the phenomenon of "missed" communication and understanding of what was expected (Ware, 2005). The intercultural aspect of VEs also increased participants' motivation to communicate in the target language. More specifically, the value of new knowledge gained to improve skills in EFL was acknowledged by Korean student teachers in a study that connected them with American student teachers: the Korean teachers felt the project motivated them to practise their EFL writing and grammar (Yang, 2020). Similarly, in a study by Ko et al. (2015), the development of intercultural competence of Physical Education (PE) graduate students between an American and Korean university was investigated. The researchers found that participation in this project motivated the participating PE professionals to learn about a different culture, improve their communication skills with students from other countries and infuse cultural themes into their teaching practice.

Other studies have observed that the involvement of participants in VE leads to an increase in *intrinsic motivation*. For instance, Ramírez-Lizcano and Cabrera-Tovar (2020) reported on a VE project between 6th-grade students at a private school in Colombia and two international partners from France and Sweden. The authors demonstrated that participants felt motivated when using English as a foreign language in other settings rather than at the school, expressing happiness and enjoyment when doing so. Similar findings were recorded by Nicolaou and Sevilla Pavon (2023) who investigated the extent to which university English for Specific Purposes students' participation in the YES3D (Youth Entrepreneurship for Society in 3D) in Virtual English as a lingua franca (VELF) affected their beliefs of their self-efficacy and their motivation to learn English. Apart from being intrinsically motivated, learners also considered learning English important as it was likely be useful in their future professional lives. Furthermore, the learners valued acquiring new technological skills.

The present chapter aims to enhance our comprehension of motivational patterns, focussing on both teachers and student teachers who took part in VALIANT VEs. To do so, the study explores the following research questions:

RQ1: To what extent have the VALIANT VEs impacted participants' perceived change in levels of motivation to study/work?
RQ2: What motivated participants to join the VALIANT VEs?
RQ3: How have the VALIANT VEs influenced participants' motivation to teach?

To answer RQ1, closed-ended items from pre-VE survey and post-VE survey that measured participants' perceived levels of motivation before and after the VE were analysed. Three types of regulatory styles from the self-determination continuum of motivation in a context of studying or working were measured: *intrinsic regulation, identified regulation,* and *external regulation* (see Figure 4.1). The items pertaining to the three types of regulations used in the surveys were:

Intrinsic regulation

Because I enjoy studying/doing my job.
Because what I do in my studies/work is stimulating.
Because what I study/the work I do is interesting.

Identified regulation

Because I personally consider it important to put effort into my studies/work.
Because putting effort into my studies/work aligns with my personal values.

External regulation

Because others will respect me more (e.g., supervisor, colleagues, students).
To avoid being criticised by others (e.g., supervisor, colleagues, students).

In order to answer RQ2 and RQ3, open-ended questions were included in the pre-, mid- and post-VE surveys:

Pre-VE survey questions:

> Why are you interested in taking part in a Virtual Exchange with teachers and student teachers?
>
> What do you hope to achieve or learn from this Virtual Exchange?

Mid-VE survey questions:

> In your VE project you are using different online tools for communicating and presenting information. Have you learned something new about technology that might be applied to your own teaching? If possible, give a concrete example to illustrate your answer.
>
> Has your VE project impacted on how you see your current work situation or your career? If so, how? If possible, give a concrete example to illustrate your answer.

Post-VE survey questions:

> Has your experience in the VE influenced how you approach your teaching/teaching career or your continued studies as a student teacher? If possible, give a concrete example to illustrate your answer.
>
> Have your expectations about what you hoped to learn or achieve in the VE been fulfilled? Why / why not?

For more details about the motivation survey, data collection and analysis, please see chapter 3.

Main Quantitative Findings

Answers to the close-ended questions in the pre- and post-VE surveys allowed us to answer RQ1 which examined the impact of VEs on participants' levels of motivation to study or work. Overall, there was no or negligible change in the perceived levels of motivation to study (student teachers) or work (teachers). Most of the participants scored relatively low in their levels of *external regulation* and quite high on their levels of *identified regulation* and *intrinsic regulation* (i.e., intrinsic motivation) at the start of their VEs. The Wilcoxon Signed Rank test was used to test if the difference between the pre- and post-VE surveys scores was significant. The results showed that there was no significant difference

in the levels of perceived external regulation, but there was statistically significant increase in perceived *identified regulation* ($Md_{pre\text{-}VE\ survey}$ = 91, $Md_{post\text{-}VE\ survey}$ = 92, z = -2.452, $p < 0.05$, r = -.12) and perceived *intrinsic regulation* ($Md_{pre\text{-}VE\ survey}$ = 77.5, $Md_{post\text{-}VE\ survey}$ = 81.3, z = -4.091, $p < 0.01$, r = -.19). However, the effect size (r) indicated that these perceived changes lacked practical significance. Thus, from a quantitative perspective, it seems that VE had little effect on the participants' perceived motivation levels. The results are summarised in Figure 4.2.

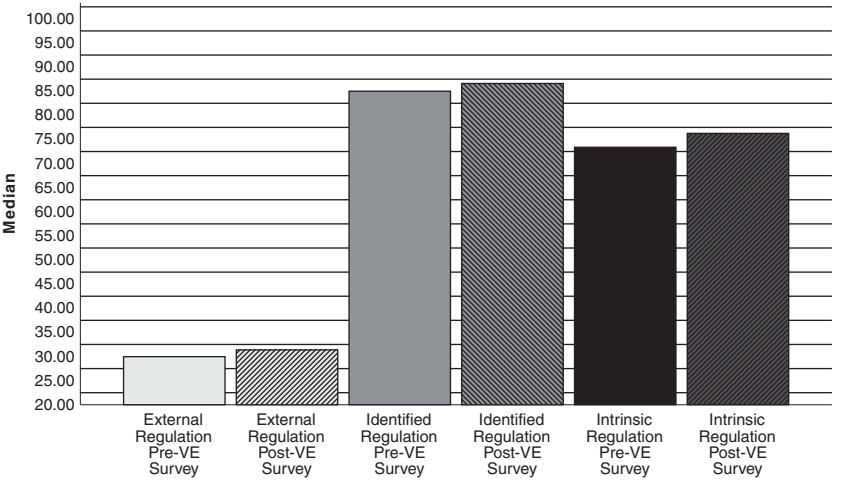

Figure 4.2: Median for the Pre-VE questionnaire and Post-VE questionnaire Scores for External Regulation, Identified Regulation and Intrinsic Regulation

The type of VE had a small effect on motivation. There was a statistically significant but practically negligible effect in one type of the VE where the teachers and student teachers collaborated closely. In those exchanges, participants showed a statistically significant but negligible increase in perceived *identified regulation* ($Md_{pre\text{-}VE\ survey}$ = 91, $Md_{post\text{-}VE\ survey}$ = 91.75, z = -2.49, $p < 0.05$, r = -0.15) and perceived *intrinsic regulation* ($Md_{pre\text{-}VE\ survey}$ = 76, $Md_{post\text{-}VE\ survey}$ = 80, z = -3.441, $p < 0.001$, r = -0.21). It is important to note that this type of exchange consisted mainly of student teachers with just a couple of teachers. There were no changes observed in the other two types of VEs i.e., (1) teachers only and (2) student teachers only.

Overall, quantitative data analysis indicates that the VALIANT VEs did not substantially impact teachers' and student teachers' motivation to study or work. Participants reported quite high initial levels of *identified regulation* and *intrinsic regulation*, which likely resulted in post-VE surveys not fully capturing any perceived change in motivation after VE completion. Although some changes in levels of motivation were statistically significant between pre-VE survey and post-VE survey scores, these changes lacked practical significance. However, quantitative data analysis only provides a partial picture and cannot capture more nuanced aspects of participants' VE experience. To better understand the impact of the VE on motivation, RQ 2 and 3 were answered using qualitative data analysis of the open-ended questions in the surveys.

Framework for Qualitative Analysis: Codebook

As already mentioned in the introduction, the self-determination theory (Ryan & Deci, 2000) was used to determine the participants' level of motivation for joining the VE but also whether the VE had an impact on their motivation to teach. The analysis was completed using essentially a thematic analysis approach, however the frequency of codes were also recorded. The analysis included both a deductive and an inductive approach since, while working with the original framework, the inductive approach was used as well, as some specific themes emerged (see Table 4.1). The codebook included all 3 types of motivation (*intrinsic motivation, extrinsic motivation*, and *amotivation*), all 6 regulatory styles (see Figure 1), and a third level of coding that emerged from our analysis. Table 4.1 presents an overview of the themes that emerged in our analysis, categorised based on the SDT.

Table 4.1. Codebook and examples

CODE	SUB-CODE	THEMES	DEFINITION	EXAMPLE	FREQUENCY
(1) Intrinsic motivation	(1.1.) Motivation to join the VE		This code includes statements in which participants reported their intrinsic motivation to join the VE.	I am really interested in learning more about the value of Virtual Exchanges. This is an opportunity to learn with and from others. Learn other points of views and improve my knowledge.	156
(2) Extrinsic motivation	(2.1) Integrated regulation				
		Integrated regulation to join the VE	This code includes statements in which participants reported their extrinsic motivation/integrated regulation that made the participants join the VE.	Because I am very interested to find the way to start a Virtual Exchange with my classrooms or my future classroom	631
		Collaboration with peers	This code includes statements in which participants reported how the VE has impacted their motivation due to different group work tasks, collaboration with peers during the VE or their motivation to work with peers in the future.	This types of group works have permitted me to work with various students, interchange our ideas about the influence of English around the world and talking with people from different cultures motivate us, I think, because we feel it is important to work in team	162

		Knowledge gained	This code includes statements in which participants reported the knowledge that has been acquired or gained and hence how the participants' motivation has increased. This code also includes statements in which participants reported their motivation towards designing teaching material. and statements in which participants refer to their motivation to "internationalise" their teaching experiences after the VE.	I am enjoying very much all the meetings so far. They have provided us with really insightful views on language teaching and also with several useful technological resources to implement in the future.	686
		More training	This code includes statements where participants refer to their "awakens" to their duties and need (but also willingness) to receive more training or more knowledge on something that was learnt during the VE.	Thanks to the discussions we made during the Virtual Exchange I realized that it is not hard to apply a Virtual Exchange in the classes in Turkey. So, I decided to do a further study about how to apply Virtual Exchange programmes in classes regarding different ages and levels. Moreover, I want to apply the Virtual Exchange programme in my future classrooms.	17

(*continued*)

Table 4.1. Continued

CODE	SUB-CODE	THEMES	DEFINITION	EXAMPLE	FREQUENCY
		Passion about being a teacher	This code includes statements made in relation to "the passion" expressed by some participants about their job. How after the VE they become "more passionate" about their profession. Or simply how after the VE their motivation to become a teacher has increased.	I am even more motivated to become a teacher and I am looking forward for my ISP where I want to use the game we created.	20
		Professional task performance	This code includes statements in which participants reported their motivation towards performing their professional tasks/duties and /or motivations in relation to their professional development.	I have got a lot of information that is really useful for my professional development. It will help me change my lesson plans and work more effectively.	371
		Value of self	This code includes statements made in relation to the VE "increase the value of self", the self-esteem or confidence of the participants in relation to their work. They feel that their job has (more) value for others. Also, the value of the profession.	I have realised that teachers are a vital fabric of a society and they must be helped and supported more than we do know.	110
	(2.2) Identified regulation				

		Identified regulation to join the VE	This code includes statements in which participants reported their extrinsic motivation/identified regulation that made the participants join the VE.	Because I think Virtual Exchanges are important for teaching.	84
		Motivated to motivate students	This code includes statements in which participants reported how they learnt or are eager to motivate their students after the VE.	It has help me be even more aware of the challenges we are going to face. For instance, in order to motivate the students and getting them engaged in the tasks, a proper teacher's preparation is needed, but I feel ready to do my best and apply all the teaching methods I am learning.	37
		Sharing experiences	This code includes statements in which participants reported the knowledge gained in the VEs and how the participants are "more" "motivated" and willing to share this knowledge with other colleagues at work	I have realized the importance of sharing and discussion in a virtual world. With the help of our meetings within the scope of the project, all the information provided has made me feel valuable to exchange my ideas about what we can do as pre-service teachers in the online classroom.	18

(*continued*)

Table 4.1. Continued

CODE	SUB-CODE	THEMES	DEFINITION	EXAMPLE	FREQUENCY
	(2.3) External regulation				
		External regulation to join the VE	This code includes statements in which participants reported their extrinsic motivation/external regulation that made the participants join the VE.	It is part of a class I am enrolled at university	6
(3) Amotivation			This code refers to being neither intrinsically nor extrinsically motivated and include statements that show that the participants find no value in participating as well as statements where they report the feeling of lack of competence to achieve a goal or a task.	[the VE] decreased my motivation to put more effort into my studies.	11

Results From Qualitative Analysis

RQ2 enquired into what motivated participants to join the VALIANT VEs. Our analysis revealed that participants' motivation to join the VALIANT VEs can be mainly classified into *intrinsic motivation* and *extrinsic motivation*. *Intrinsic motivation* (167 instances) appears in teachers' and student teachers' statements, reporting feelings of belonging and connectedness, interest, enjoyment, inherent satisfaction and a high level of autonomy as in examples (1) and (2):

(1) *I am looking forward to learning new things and getting to know different cultures. I think that this can be a very inspiring and motivating project.*
(2) *I hope to understand other people's perspectives, how they see things and their point of views, and I would also love to see how other cultures and other people try to solve a problem when encountered to find out whether there are differences or not*.

Example (1) illustrates the participant's internal enthusiasm to acquire new knowledge and immerse in different cultures, finding the project to be a source of inspiration and motivation. Likewise, in example (2), we observe a reinforcement of intrinsic motivation as the participant's goal is to comprehend various viewpoints and approaches to problem-solving. Both participants expressed that their curiosity drives their interest in exploring these facets, signifying a strong sense of autonomy and personal fulfilment attached to participation in the VALIANT VEs.

In contrast to *intrinsic motivation*, *extrinsic motivation to join the VEs* refers to the participants' willingness to learn about other ways to teach. This type of motivation can be ordered along the self-determination continuum from higher to lower levels of self-determination: *Integrated regulation to join the VE* (631 instances), such as in (3), *Identified regulation to join the VE* (84 instances), such as in (4), and *External regulation to join the VE* (6 instances), such as in (5).

(3) *I want to learn more about other cultures and ways of teaching and motivate students.*
(4) *I was looking for projects to participate in and one of my professors advised me to enrol in this project.*
(5) *It is mandatory for the course I am taking -- it was not my decision*.

Integrated regulation represents the highest level of self-determination within the extrinsic motivation framework. In (3) the participant expresses a desire to learn more about other cultures, which is similar to the intrinsic motivation seen in examples (1) and (2). However, in example (3), this interest is not solely integrated into personal values and goals; it is also part of an extrinsic motivation guided by the participant's willingness to engage in an activity because it aligns with their desire to learn "new ways of teaching and motivate students", that is, an integration of personal values with motivation originating from outside influences.

Identified regulation falls in the middle of the self-determination continuum. In (4) the participant's decision to join the VE is influenced by external advice, specifically a recommendation from a professor. While the motivation is not entirely self-generated, the participant has identified a reason for participation that aligns with his/her interests. This indicates a moderate level of autonomy, as the participant has recognised the value in the project and decided to engage based on his/her own understanding of its benefits.

External regulation represents the lowest level of self-determination in extrinsic motivation. In (5) the participant states that his/her participation is "mandatory for a course". This type of motivation is primarily driven by external pressures or requirements, with minimal personal choice or autonomy. In this case, the participant's engagement in the VE is largely compulsory and not based on his/her intrinsic interest or personal goals.

Finally, *Amotivation* towards joining the VALIANT VEs has minimum representation in the participants' responses (only 5 instances). These statements mainly refer to participants' lack of goals and hesitation to join the VEs, such as in (6).

(6) I have no particular goals for this endeavour and hope it is not a waste of time.

In (6) the participant conveys a sense of disinterest or uncertainty about the project's purpose and its potential value, showing lack of motivation in engaging in VALIANT VEs. While amotivation is the least common form of motivation observed among participants' responses to join the VEs, it is important to note its presence as it contrasts with the more prevalent intrinsic and extrinsic motivations discussed earlier. Participants who express amotivation may require additional support or clarification regarding the project's objectives to increase their engagement and commitment.

Regarding RQ3, investigating VALIANT VEs influence on participants' motivation to teach, our qualitative findings reveal that all participants perceived that the VEs have impacted their motivation extrinsically. A possible explanation to this finding may lie in the fact that extrinsically motivated behaviours are instrumental in nature, that is, they are "not performed for the activity itself but rather as a means to an end" (Fernet et al., 2008, p. 258). In other words, through their participation in the VEs, teachers and student teachers attained a separable outcome. However, extrinsic motivation can vary greatly in its relative autonomy.

When it comes to *integrated regulation* (2063 statements – the most autonomous form of extrinsic motivation), we observe that participants' responses are aligned with their own values and needs. In addition, even though the reported actions share many qualities with intrinsic motivation, they are considered here to be extrinsic because they are carried out to attain separable outcomes rather than for the participants' inherent enjoyment. Within *integrated regulation*, *knowledge gained* was the most prominent theme with 686 instances. In these instances, it is possible to observe that the knowledge gained during the VE has impacted the participants' motivation towards teaching, as in (7); their willingness to internationalise their teaching practices, as in (8); or participants reported motivation towards designing teaching material, as in (9).

(7) *From teachers, I have learned various methods to make the students more motivated during the lesson. I will take those points away for my future career.*
(8) I would like to internationalise my teacher network.
(9) I have learned that there are apps that allow me to create children's book looking story books which will help me in my career.

In (7), the participant mentions having learned various methods to enhance student motivation during lessons and express a clear intention to apply these newfound techniques in his/her future teaching career. Similarly, in (8) the statement indicates that the participant has incorporated the goal – "I would like to"- of expanding the teaching practices on a global scale into his/her own values and needs. Also, in (9) the knowledge gained during the VE indicates positive impact on the motivation to teach which "will help [him/her] in [their] career". These examples suggest that the VEs had a positive impact on participants' teaching motivation by connecting extrinsic goals with their intrinsic values and interests.

Another salient theme within *integrated regulation* is *professional task performance* (371 instances). Here, we can observe statements in which participants reported increased levels of motivation towards performing their professional tasks or duties after having attended the VE and a sense of professional development, as in (10):

(10) *My vision of the education system is now quite different. This experience has shown me that another way of teaching English is possible. I've found out what the TBL approach is (I found it fascinating) and I'm sure it will help me to create different, innovative lessons for my pupils.*

In example (10), the participant's motivation is closely tied to professional growth as an educator. After attending the VE, the participant has discovered new teaching approaches like the TBL method, which has sparked his/her fascination "I found it fascinating". This newfound awareness, "My vision of the education system is now quite different", has awakened the motivation to create innovative lessons for the students, reflecting a commitment to professional development and improved task design.

Collaboration with peers (162 instances) and *value of self* (110 instances) also appear as prominent themes within *integrated regulation*. The former includes statements in which participants reported how the VE has impacted their motivation due to different group work tasks, collaboration with peers during the VE or their motivation to work with peers in the future, as in (11). The latter refers to those statements where participants explain how the VE has increased their self-esteem or confidence in relation to their work, as in (12).

(11) *Working with partners from abroad has been an impulsion to work harder. It has been a great source of motivation while studying on the topics.*

(12) *It has served to make me feel more confident about becoming a teacher. It has also made me feel more enthusiastic about it and made me realise that this is the path I want to follow.*

In (11), the participant highlights how collaboration has become a significant "source of motivation", emphasising the role of relatedness in SDT. The participant's willingness to work with peers and the motivation derived from this social interaction align with SDT's concept of relatedness, which underscores the importance of interpersonal connections in motivating individuals.

The newfound confidence showcased in (12), "[I] feel more confident", and enthusiasm, "[I]feel more enthusiastic", are indicative of an increase towards intrinsic motivation as the participant is now more self-determined and enthusiastic about pursuing their chosen career path. Essentially, the VE experience has fostered a greater sense of autonomy and competence in the participant's teaching profession.

Less prominent but recurring themes within *integrated regulation* are *passion about being a teacher* (20 instances), as in (13); and enthusiasm about receiving *more training* (17 instances), as in (14).

(13) I want to be as passionate about my job as our teachers have been. I will bear in mind that being a teacher means that you have to put effort in your skills constantly and that learning and developing is a constant part of the job.

(14) 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 training.

In (13), the participant expresses a desire to be as passionate about their job as their teachers have been. The participant's motivation to put effort into his/her teaching skills and continuous learning is integrated into their personal values and the perceived importance of these qualities in their teaching profession. While it is not purely intrinsic, as it involves aligning with external values, it reflects a sense of personal autonomy and the integration of professional values into his/her motivation.

In (14), the participant sees the VE as an opportunity to enhance his/her teaching education beyond traditional methods. The participant's drive for additional training "I would like to follow further training" integrates with his/her quest for professional growth and the innate interest in improving teaching skills and knowledge. This signifies personal autonomy and competence in his/her career, driven by the alignment of professional development with intrinsic interests and career objectives.

With regard to *identified regulation* (140 instances), apart from the statements referring to the rationale for joining the VEs (84 instances) as in example (4), two main themes emerged within this category: after participating in the VE, in-service and student teachers were *motivated to motivate students* (37 instances), and they were also more prone to *sharing experiences* (18 instances), as in (15) and (16), respectively.

(15) We work on vocabulary (jobs, shopping, food, restaurant) but our main task is the motivation factor. All of the teachers struggle with motivating the students

to learn a new/second language. Therefore, I have learned a lot about the difficulties that they experience (that I could experience as well.)

(16) Learning from each other is an important step for us prospective teachers. When it comes to experience, teachers always go one step ahead of our profession, and therefore they are most likely able to help us out through challenges. Therefore, I have realised the importance of sharing, and I hope to contribute to pre-service teachers with my experiences in the future, too.

Identified regulation involves behaviours driven by internalised "somewhat internal" (Ryan & Deci, 2000, p. 72) motivations rooted in a perceived understanding of their value. In (15), the participant highlights the teacher's responsibility in motivating students, emphasising the recognition of the value and significance of this task, even when it is not inherently motivating, as indicated by "the teachers struggle with motivating the students to learn a new/second language." The participant's motivation to assist students in overcoming language learning challenges exemplifies identified regulation.

In (16), the participant emphasises learning from experienced colleagues, particularly teachers, as crucial for professional growth. The motivation to share and learn from others is rooted in recognising the significance of these interactions, aligning with identified regulation, where motivation arises from understanding the importance of such exchanges, even if not entirely intrinsic.

Moving to the lower level of self-determination, the responses of the participants did not portray any statement that could be characterised under the *introjected regulation* and *external regulation* categories. These findings are in line with the quantitative results which showed that, after the VEs, there was an increase in teachers' and student teachers' self-determined types of motivation (i.e., *intrinsic motivation*, *integrated regulation*, and *identified regulation*). Finally, in the lowest level of the self-determination continuum resides *amotivation* which results from not valuing an activity. As we saw, most of the statements referring to this category were related to the participants' lack of goals and hesitation to join the VEs. However, we also found statements expressing *amotivation* after the VE experience (6 instances), as in (17):

(17) It made me feel a little bit disappointed and unmotivated when I realised that not every member of the group was as compromised with the Virtual Exchange as they should be.

In (17), the participant expresses a sense of disappointment and amotivation after the VE experience due to the realisation that not all group members were equally committed to the VE, that is, not all group members were "compromised" in their level of dedication or involvement in the VE as expected. This statement highlights how the level of amotivation can emerge not only from the lack of initial interest or goals but also because of the negative experiences during the VE. It also underscores the importance of fostering a supportive and engaged environment within VEs to maintain participants' motivation and commitment throughout the exchange.

Conclusion

This part of the study investigated whether VALIANT VEs impacted on participants' levels of motivation. More specifically, it sought to discern what motivated participants to join the VALIANT VEs, and to what extent and how the VALIANT VEs influenced participants' motivation to teach. Overall, the quantitative findings revealed there was little to no change observed in the levels of motivation as measured by the pre- and post-VE surveys. However, upon conducting a more in-depth qualitative analysis, an alternative perspective emerged. In accordance with previous research on motivation in VE, our findings corroborate the enhancement of intrinsic motivation, as demonstrated by Nicolaou and Sevilla Pavon (2023). Additionally, our study highlights the importance of acquiring new knowledge within the VE context, leading to a boost in motivation, aligning with the conclusions drawn by Yang (2020). Furthermore, our results align with the work of Ko et al. (2015), who similarly found that collaboration with peers significantly increased participants' motivation. Furthermore, both the shared experiences within the project and the collaborative efforts among the participants have demonstrated a notable enhancement in the motivation levels of in-service and student teachers. These results are consistent with the research conducted by Demir and Kayaoğlu (2021), which revealed that the inclusion of real-world experiences in a VE project had a positive effect on students' motivation.

Our study extends beyond the existing research by unveiling additional positive outcomes not previously reported. For instance, after engaging in the VEs, the participants exhibited enhanced motivation towards performing professional tasks, an increased sense of self-worth and strong enthusiasm for their profession as teachers or becoming teachers. Additionally, the participants were willing to receive further training in the various topics covered by the VALIANT VE, and they also displayed increased motivation to inspire and motivate their students.

Contrary to most studies pertaining to motivation that focus on either students or teachers respectively, this study investigated both the teachers' and student teachers' motivation levels in participating in VEs and and the implications VEs can have on their professional lives as teachers or future teachers. Finally, this study provided an example of how the SDT theoretical framework can be used in the analysis of teachers' and student teachers' motivation levels in VE participation.

References

Deci, E. L., & Ryan, R. M. (2015). Self-Determination theory. In J. Wright (Ed.), *International Encyclopedia of the social & behavioral sciences* (2nd ed., pp. 486–491). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.26036-4

Demir, N., & Kayaoğlu, M. N. (2021). Multi-dimensional foreign language education: the case of an eTwinning project in Turkey. *Computer Assisted Language Learning*, *35*(9), 2201–2238. https://doi.org/10.1080/09588221.2020.1871027.

Dörnyei, Z., & Ushioda, E. (2001). *Teaching and researching motivation*. Longman.

Fernet, C., Sencal, C., Guay, F., Marsh, H., & Dowson, M. (2008). The Work Tasks Motivation Scale for Teachers (WTMST). *Journal of Career Assessment*, *16*(2), 256–279. https://doi.org/10.1177/1069072707305764

Han, J., & Yin, H. (2016). Teacher motivation: Definition, research development and implications for teachers. *Cogent Education*, *3*(1), https://doi.org/10.1080/2331186X.2016.1217819

Kumari, J., & Kumar, J. (2023). Influence of motivation on teachers' job performance. *Humanities & Social Sciences Communications*, *10*(1). https://doi.org/10.1057/s41599-023-01662-6

Ko, B., Boswell, B., & Yoon, S. (2015). Developing intercultural competence through global link experiences in physical education. *Physical Education and Sport Pedagogy*, *20*(4), 366–380. https://doi.org/10.1080/17408989.2013.837441

Nicolaou, A., & Sevilla-Pavón, A. (2023) Exploring the impact of Virtual Exchange in Virtual English as a lingua franca (VELF): Views on self-efficacy and motivation. In Pineda, I. & Bosso, R. (Eds.), *Virtual English as a Lingua Franca* (pp. 173–194). Routledge.

Ramírez-Lizcano, N., & Cabrera-Tovar, M. A. (2020). Efl learners' perceptions about language learning and culture when using telecollaboration. *Profile: Issues in Teachers' Professional Development*, *22*(2), 95–113. https://doi.org/10.15446/profile.v22n2.82213

Ryan, R. M., & Deci, E. L. (2000). Self-Determination Theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. https://doi.org/https://doi.org/10.1037/0003-066X.55.1.68

Shikalepo, E. E. (2020). The role of motivational theories in shaping teacher motivation and performance: A review of related literature. *International Journal of Research and Innovation in Social Science (IJRISS)*, *4*(4), 64–76.

Ware, P. (2005). "Missed" communication in online communication: Tensions in a German-American telecollaboration. *Language Learning & Technology*, *9*(2), 64–89.

Yang, S. J. (2020). Perceived benefits of using telecollaboration for preservice English teachers. *English Teaching*, *75*(3), 109–131.

Gabriella von Lieres und Wilkau, Margarida Morgado, Melinda Dooly Owenby, Ute Massler, Xiaoting Yu, Carina Schonberg & Jekaterina Rogaten

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 ($Md_{\text{pre-VE survey}} = 30.1$; $Md_{\text{post-VE survey}} = 29.7$) than those who answered that they were feeling at least somewhat isolated ($Md_{\text{pre-VE survey}} = 42.1$; $Md_{\text{post-VE survey}} = 41$). A similar pattern was also observed for student teachers (not professionally isolated: $Md_{\text{pre-VE survey}} = 30.5$, $Md_{\text{post-VE survey}} = 34.2$; at least somewhat isolated: $Md_{\text{pre-VE survey}} = 43.2$, $Md_{\text{post-VE survey}} = 41.2$).

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.

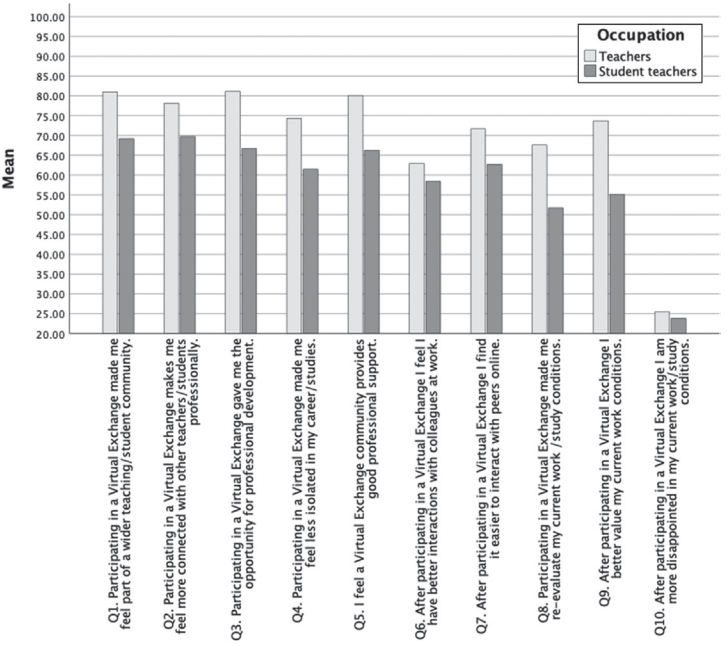

Figure 5.1: Descriptive statistics and t-test results for teachers' and student teachers' ratings of VE impact

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 professionally 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 teachers 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 presented 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

(*continued*)

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

(*continued*)

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 suitable 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.

References

Ballantyne, J., & Zhukov, K. (2017). A good news story: Early-career music teachers' accounts of their "flourishing" professional identities. *Teaching and Teacher Education*, *68*, 241–251. https://doi.org/10.1016/j.tate.2017.08.009G

Boyd, D., Lankford, H., Loeb, S., & Wyckoff, J. (2005). Explaining the short careers of high-achieving teachers in schools with low-performing students. *American Economic Review*, *95*(2), 166–171. https://doi.org/10.1257/000282805774669628

Braun, V., & Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://psycnet.apa.org/doi/10.1191/1478088706qp063oa

Burton, M., Brown, K., & Johnson, A. (2013). Storylines about rural teachers in the United States: A narrative analysis of the literature. *Journal of Research in Rural Education*, *28*(12), 1–18.-o

Çankaya, İ. H., Karakuş, M., & Demirtaş, Z. (2009). The effect of mentoring roles displayed by teaching staff on emotional and social loneliness levels of teacher candidates. *Procedia – Social and Behavioral Sciences*, *1*(1), 2207–2210. https://doi.org/10.1016/j.sbspro.2009.01.388

DiTommaso, E., Brannen, C., & Best L. A. (2004). Measurement and validity characteristics of the short version of the social and emotional loneliness scale for adults. *Educational and Psychological Measurement*, *64*(1), 99–119.

DiTommaso, E., & Spinner, B. (1993). The development and initial validation of the Social and Emotional Loneliness Scale for Adults (SELSA). *Personality and Individual Differences*, 14(1), 127–134. https://doi.org/10.1016/0191-8869(93)90182-3

Echazarra, A., & T. Radinger (2019). Learning in rural schools: Insights from PISA, TALIS and the literature. *OECD Education Working Papers*, No. 196, OECD Publishing. https://doi.org/10.1787/8b1a5cb9-en.

The EVALUATE Group. (2019). *Evaluating the impact of Virtual Exchange on initial teacher education: A European policy experiment.* Research-publishing.net. https://research-publishing.net/book?10.14705/rpnet.2019.29.9782490057337

Heider, K. (2005). Teacher isolation: How mentoring programs can help. *Current Issues in Education*, *8*(14). https://cie.asu.edu/ojs/index.php/cieatasu/issue/view/41

Hoaglund, A., Birkenfeld, K., & Box, J. (2014). Professional learning communities: Creating a foundation for collaboration skills in pre-service teachers. *Education*, *134*(4), 521–528. https://doi.org/10.5195/jmla.2021.1263

Johnson, B., Down, B., Le Cornu, R., Peters, J., Sullivan, A., Pearce, J., & Hunter, J. (2014). Promoting early career teacher resilience: A framework for understanding and acting. *Teachers and Teaching*, *20*(5), 530–546. https://doi.org/10.1080/13540602.2014.937957

Johnson, S. M., Reinhorn, S., & Simon, N. (2018). Ending isolation: The payoff of teacher teams in successful high-poverty urban schools. *Teachers College Record: The Voice of Scholarship in Education*, *120*(5), 1–46. https://doi.org/10.1177/016146811812000502

Kilpatrick, S., & Fraser, S. (2019). Using the STEM framework collegially for mentoring, peer learning and planning. *Professional Development in Education*, *45*(4), 614–626. https://doi.org/10.1080/19415257.2018.1463925

Knight, S. W. P. (2020). Establishing professional online communities for world language educators. *Foreign Language Annals*, *53*(2), 298–305. https://doi.org/10.1111/flan.12458

Kutoane, M, Brysiewicz, P., & Scott, T. (2021). Interventions for managing professional isolation among health professionals in low resource environments: A scoping review. *Health Science Report*, *4*(e361). https://doi.org/10.1002/hsr2.361

Nolan, A., Morrissey, A.-M., & Dumenden, I. (2013). Expectations of mentoring in a time of change: Views of new and professionally isolated early childhood teachers in Victoria, Australia. *Early Years*, *33*(2), 161–171. https://doi.org/10.1080/09575146.2013.781137

OECD. (2016). A new rural development paradigm for the 21st century: A toolkit for developing countries. *OECD Publishing.* http://dx.doi.org/10.1787/9789264252271-en.

Ostovar-Nameghi, S. A., & Sheikhahmadi, M. (2016). From teacher isolation to teacher collaboration: Theoretical perspectives and empirical findings. *English Language Teaching*, *9*(5), 197. https://doi.org/10.5539/elt.v9n5p197-ok

Padwa, L., Kelly, A. M., & Sheppard, K. (2019). Chemistry teacher isolation, contextual characteristics, and student performance. *Journal of Chemical Education*, 96(11), 2383–2392. https://doi.org/10.1021/acs.jchemed.9b00392.

Rogers, D. L., & Babinski, L. M. (2002). *From isolation to conversation: Supporting new teachers' development*. State University of New York Press.

Tsang, K. K. (2018). Teacher alienation in Hong Kong. *Discourse: Studies in the Cultural Politics of Education*, *39*(3), 335–346. https://doi.org/10.1080/01596306.2016.1261084

Wu, Q., & Cormican, K. (2021). Shared leadership and team effectiveness: An investigation of whether and when in engineering design teams. *Frontiers in Psychology*, *11* (art. 569198). https://doi.org/10.3389/fpsyg.2020.569198

Margarita Vinagre, Anna Nicolaou, Shannon Sauro,
Pia Sundqvist & Jekaterina Rogaten

6. Impact of Virtual Exchange on teachers' and student teachers' digital collaboration skills

Introduction

If there is a lesson that the COVID-19 pandemic has taught us it is that teachers have to be digitally competent to engage their students in online collaborative learning. This highly valuable lesson is here to stay, as some studies have emphasised (Educause Horizon Report, 2021). However, teachers are not always prepared to engage their students in innovative practices that foster the development of collaborative skills and digital competences (Hauck & Satar, 2018; Vinagre, 2017). One such practice is Virtual Exchange (VE), which has been increasingly integrated in teacher education programs because VE provides teachers with the opportunity to use technological tools, and to experience and reflect on their own techno-pedagogical skills in authentic intercultural contexts (Hauck & Kurek, 2017). Large-scale studies of student teachers who take part in VE have found that this pedagogical practice can indeed improve their digital collaborative skills (see for example The EVALUATE Group, 2019).

Even prior to the COVID-19 pandemic, calls for teacher training to include a focus on digital competences emerged alongside the growth and ubiquity of technology in teaching and learning (see, for example, Hubbard, 2008). What has transformed over time, however, is the specific focus of such training: instead of an emphasis on technology-specific skills, teachers and student teachers are now required to have the skills and knowledge encompassed by digital literacy.

In its simplest form, digital literacy can be defined as "the modes of reading, writing and communication made possible by digital media" (Hafner et al., 2015, p. 1). On a more nuanced level, these modes of reading and writing necessitate a range of skills and knowledge to manage

and make sense of information conveyed through digital media, which is integral to digital literacy/competence. Accordingly, digital literacy has been defined as "including competencies associated with assembling information, reading and understanding multimedia and hypermedia texts, finding and critically evaluating information, and working collaboratively to communicate information" (List, 2019, p. 147). In the context of VE as a pedagogical practice for bringing together teachers and student teachers, the skills of digital literacy also require the skills inherent to collaboration and interaction through digital means. Thus, the sub-competences of the Digital Competence Framework for Citizens (DigComp) 2.1 (Carretero et al., 2017), provide a useful lens for merging the digital skills, knowledge and attitudes required of teachers and student teachers collaborating through technologies. Although there is a specific DigComp framework for educators (DigCompEdu), the authors decided to use DigComp 2.1 for data analysis instead because the former focuses on educators' professional activities and, therefore, some of the framework's components were not applicable to participating student teachers. DigComp 2.1 represents an advancement on the previous model since it builds upon the conceptual model initially introduced in DigComp 2.0. The purpose of DigComp is to provide a reference framework for individuals, organisations, and policymakers to understand and assess digital competence. It aims to define the key competences required to use digital technologies effectively and confidently in various personal, social, and work-related contexts. DigComp 2.1 is designed to be applicable to all individuals, regardless of their level of digital proficiency, and across different domains, such as education, employment, and personal life. The conceptual reference model identifies key components of digital competences in 5 areas and 21 sub-competences that are pertinent to these areas (see Figure 6.1). The areas include Information and data literacy, Communication and collaboration, Digital content creation, Safety and Problem solving, and are summarised as follows:

1. Information and data literacy: To articulate information needs, to locate and retrieve digital data, information and content. To judge the relevance of the source and its content. To store, manage, and organise digital data, information and content.
2. Communication and collaboration: To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity. To participate in society through public and private digital services

and participatory citizenship. To manage one's digital presence, identity and reputation.

3. Digital content creation: To create and edit digital content. To improve and integrate information and content into an existing body of knowledge while understanding how copyright and licences are to be applied. To know how to give understandable instructions for a computer system.
4. Safety: To protect devices, content, personal data and privacy in digital environments. To protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion. To be aware of the environmental impact of digital technologies and their use.
5. Problem solving: To identify needs and problems, and to resolve conceptual problems and problem situations in digital environments. To use digital tools to innovate processes and products. To keep up-to-date with the digital evolution.

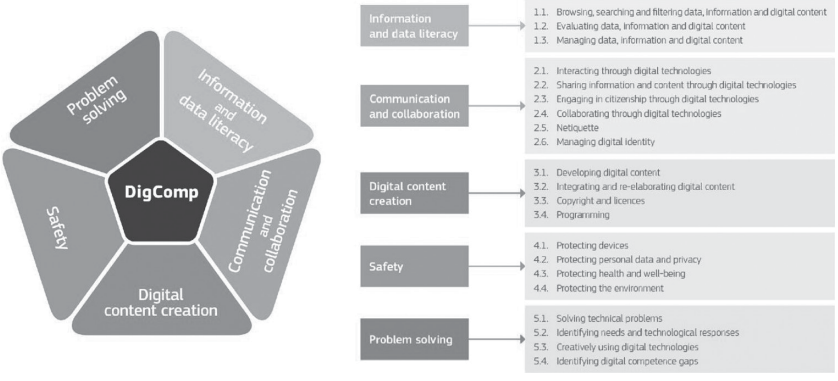

Figure 6.1: DigComp 2.1 framework

These 5 areas and their respective sub-competences compose the framework which served as the analytical tool for this portion of the VALIANT study (i.e., digital competence development) and further details about its application in this investigation will be provided in section 4. Although the entire framework was used as the tool for data analysis, given the nature of VE, the topics participants discussed, the tasks they carried out and the items and questions included in the pre-, mid- and post-VE surveys, a development in areas 2, 3 and 5 of the framework was expected with little or no development in areas 1 and 4.

Our research interest in this chapter extended beyond the exploration of participants' digital competence to also include their digital attitude. Digital competence and digital attitude are two distinct concepts related to

individuals' relationship with digital technologies. While they are interrelated, they concentrate on different aspects of a person's interaction with digital environments. In this study, we understand *digital competence* as the ability of individuals to effectively utilise digital technologies and resources to achieve specific goals, while *digital attitude* is understood as an individual's positive mindset towards adopting digital technologies, as well as motivation and willingness to engage with digital technologies. Both digital competence and digital attitude are central aspects in today's digital era, as they complement each other to empower individuals to fully participate in the digital world and cope with its challenges.

Research Questions

The following three research questions (RQs) guided our study:

RQ1. To what extent does engagement in Virtual Exchange contribute to teachers' and student teachers' perceived digital competence development?
RQ2. What areas and sub-competences are the most developed in VE according to participants' perceptions?
RQ3. Is there a perceived improvement in participants' attitudes towards digital competence?

To answer RQ1, close-ended items were included in the pre- and post-VE surveys as follows:

Digital Competence:

When it came to assessing digital competence, the study utilised closed-ended questions that specifically targeted participants' self-assessed skills in navigating online networks, collaborating with fellow educators to create digital resources, and adopting new digital pedagogical approaches as part of their continuous professional development:

> I can use online networks of teachers to collaboratively develop digital resources

I can use online networks to collaborate with other educators on innovative pedagogical practices
I can use professional collaborative networks as a source for my own professional development

To answer RQ2, the following open-ended questions were included in the pre-, mid- and post-VE surveys. These questions were also used to investigate aspects of the other areas in the VALIANT study (i.e., motivation, isolation, intercultural competence, self-efficacy and other transversal competences, as well as expectations about learning in VE):

What have you learned from taking part in this Virtual Exchange?
Did anything happen during this exchange which made a particular impact on you? If so, could you tell us about it?
If you were going to take part in a Virtual Exchange like this again in the future, is there anything you would like to be done differently?
Has your experience in the Virtual Exchange influenced how you approach your teaching/teaching career or your continued studies as a student teacher? If possible, give a concrete example to illustrate your answer.
Have your expectations about what you hoped to learn or achieve in the Virtual Exchange been fulfilled? Why/why not?
Did you have access to any particular networks and materials through this Virtual Exchange that you think will be especially useful for your professional development?
Do you think the collaboration with teachers helped you to gain a better understanding of your future profession?

Finally, to answer RQ3 close-ended items were included in the pre- and post-VE surveys as follows:

Digital Attitude:

In terms of digital attitude, the study employed closed-ended questions that specifically targeted teachers' positive or negative attitudes towards promoting online collaboration among colleagues and students. Furthermore, it aimed to assess their motivation to engage students in activities involving online collaboration within international contexts:

I believe in the value of promoting the use of online collaboration among my colleagues
I believe it is beneficial for my students to experience online collaboration
I plan to engage my students in projects and activities which involve online international collaborative learning

Data collected from the items and questions above were analysed following a mixed methods approach described in detail in Chap. 3. To answer RQ1 and RQ3 the data collected were analysed quantitatively (descriptive and inferential statistics), while to answer RQ2 the data collected were coded and analysed qualitatively. Findings from these analyses are presented and discussed below.

Main Quantitative Findings

RQ1. To what extent does engagement in Virtual Exchange contribute to teachers' and student teachers' perceived digital competence development?
RQ3. Is there a perceived improvement in participants' attitudes towards digital competence?

Overall results showed that there was no change in the control group in their digital competence or attitude. The VE participants, however, reported a significant moderate improvement in their perceived digital competence ($Md_{pre\text{-}VE\ survey} = 70.5$, $Md_{post\text{-}VE\ survey} = 83.3$, $z = -10.062$, $p < 0.001$, $r = -0.48$) and significant but negligible increase in their perceived digital attitude ($Md_{pre\text{-}VE\ survey} = 83.7$, $Md_{post\text{-}VE\ survey} = 87.5$, $z = -4.142$, $p < 0.001$, $r = -0.2$). The median for perception of digital competence and attitude development in the pre- and post-VE surveys is summarised in Figure 6.2.

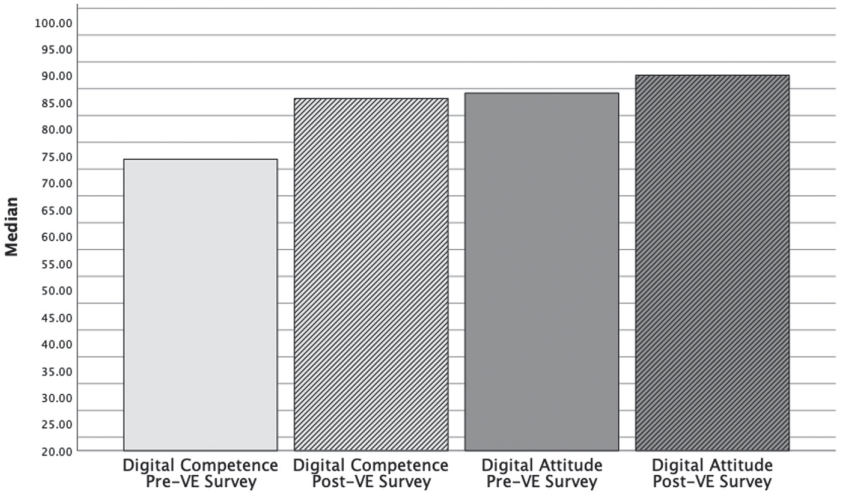

Figure 6.2: Median change in participants' perceptions of digital competence and digital attitude (pre- and post-VE surveys, 3 rounds)

In relation to the participants' occupation, both teachers and student teachers perceived a moderate and significant improvement across digital competences: teachers $Md_{\text{pre-VE survey}} = 73.7$, $Md_{\text{post-VE survey}} = 86$, $z = -5.51$, $p < 0.001$, $r = -0.41$; and student teachers $Md_{\text{pre-VE survey}} = 69.3$, $Md_{\text{post-VE survey}} = 81.7$, $z = -8.447$, $p < 0.001$, $r = -0.53$. Perceptions of digital attitude also changed significantly for both groups, but the magnitude of change was negligible: teachers $Md_{\text{pre-VE survey}} = 86.7$, $Md_{\text{post-VE survey}} = 90$, $z = -2.857$, $p < 0.01$, $r = -0.21$; student teachers $Md_{\text{pre-VE survey}} = 81.7$, $Md_{\text{post-VE survey}} = 83.3$, $z = -3.03$, $p < 0.01$, $r = -0.19$ (see Figure 6.3).

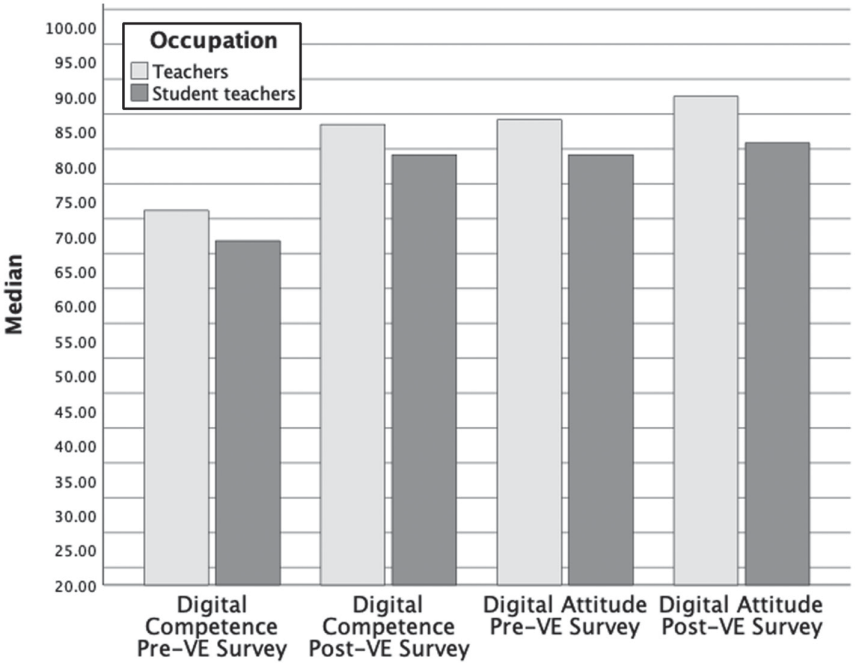

Figure 6.3: Total results of teachers' and student teachers' perceptions of digital competence and attitude according to participant occupation

In relation to the type of VE participants engaged in (teachers only, student teachers only, and mixed teachers with student teachers), there were some differences. The greatest improvement in digital competences was found in the VE type where student teachers collaborated with teachers ($Md_{pre\text{-}VE\ survey}$ = 72, $Md_{post\text{-}VE\ survey}$ = 86.3, z = -9.354, $p < 0.001$, r = -0.57). This type of exchange was also the one where participants most improved in their digital attitudes ($Md_{pre\text{-}VE\ survey}$ = 84.3, $Md_{post\text{-}VE\ survey}$ = 89.3, z = -4.119, $p < 0.001$, r = -0.25). The exchange where student teachers collaborated with other student teachers showed significant change only in digital competence ($Md_{pre\text{-}VE\ survey}$ = 66, $Md_{post\text{-}VE\ survey}$ = 79.3, z = -4.261, $p < 0.001$, r = -0.41) but not in attitude ($Md_{pre\text{-}VE\ survey}$ = 83.3, $Md_{post\text{-}VE\ survey}$ = 82.2, z = -0.836, $p > 0.05$, r = -0.08). Finally, there was no change observed in neither digital competence nor attitude in the VE type where teachers collaborated with other teachers.

Overall, the results of the quantitative analysis showed that VE helped to develop participants' digital competence and attitude quite consistently.

For both teachers and student teachers the main benefit was in developing their digital competence. It is also apparent that teachers and student teachers who signed up to take part in the VEs already scored quite high on those items related to positive digital attitude in the pre-VE survey. As a result, there was less room for improvement in digital attitude in the post-VE survey (ceiling effect). This ceiling effect was observed in other similar research projects e.g., EVOLVE (EVOLVE Project Team, 2020), EVALUATE (The Evaluate Group2019), and EVE (Hemp & van der Velden, 2021) and had less impact on digital competence. Nonetheless, quantitative measures enabled us to reliably measure digital attitudes and competences and results showed that participating in VE did help teachers and student teachers improve both.

However, quantitative results only provided a partial picture due to the limitations of the surveys used. One such limitation is the general character and small number of items that assessed digital competence. Therefore a qualitative analysis of the answers to the open-ended questions was conducted to gain a deeper understanding of the VE impact on the development of specific digital sub-competences.

Framework for Qualitative Analysis: Codebook

As already mentioned in the introduction, the Digital Competence Framework for Citizens 2.1 (DigComp, 2017) was used as the basis for coding and analysing qualitative data. The codebook included all 5 areas and all 21 sub-competences that are pertinent to these areas (see Table 6.1, areas correspond to codes 1–5 on the left column and their respective sub-competences are included in the middle column). In addition, another 6 areas (codes 6–11) which include other learning or achievements, general comments, denying any learning, suggestions, problems, and uncertain were added in order to cater for all observed data. The additional areas were utilised as follows:

> Other learning or achievements: When participants reported other learning gains that were not mentioned in the DigComp framework, such as intercultural learning, increased confidence, development of linguistic competence (e.g., "it helped me understand something about my knowledge of English language and that I have to read more")

General comments: When participants made comments describing their overall experiences with the VE (e.g., "positive impressions", "I learnt a lot", "interaction has been fun so far")
Denying any learning: When participants reported that they learned nothing new regarding the use of technologies or digital collaboration (e.g., "not yet")
Suggestions: When participants put forward ideas for improving the experience and learning in VE (e.g., "suggestions for improvement, maybe create a group on a social network so we can have a faster contact with each other. A kind of chat.")
Problems: When participants reported problems or challenges they faced during their participation in the VE (e.g., "I've found some difficulties with the schedule")
Uncertain: When coders were uncertain about where they should code a unit of data. In this case coders held discussions and either coded the segments into the existing codes or created new ones.

All 11 areas were introduced in NVivo as nodes and each of the participants' answers was analysed as a unit and coded in one or various nodes as applicable. The final codebook together with examples of data coding can be seen in Table 6.1. It should be noted that all examples from participants included in this chapter are in the original form; that is, no corrections have been made.

Table 6.1. Codebook and examples

Codes	**Sub-Codes**	**Examples**	**Frequency**
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content	As we have searched different webs, I realise to have more information and clear ideas about this issue.	4
	1.2 Evaluating data, information and digital content	Not so much that I have learned but made me think about applying it more than I already thought I should may become necessary rather than staying an option.	7
	1.3 Managing data, information and digital content	Creating, managing, recording and uploading zoom meetings was new for me.	13

Table 6.1. Continued

Codes	Sub-Codes	Examples	Frequency
2. Communication and Collaboration	2.1 Interacting through digital technologies	I am thoroughly enjoying the Virtual Exchange experience, as interactions are proving to be extremely insightful and enriching. They help us see what language teaching an learning is like in other contexts and the different challenges that teachers face within the educational system	547
	2.2 Sharing through digital technologies	I have learnt the differences and similarities between the linguistic landscapes of Madrid and Gmünd. My German peers helped me understand this topic better since I have never been to Gmünd and I was not aware of how things work there. By sharing their own experiences, I could broaden my perspective about this topic and compare it to my experience	393
	2.3 Engaging in citizenship through digital technologies	It was very interesting to learn how the students with special needs are reacting to certain topics, what they enjoy and what is to difficult/overwhelming for them. We as a group definitely took this into consideration when creating our game.	2
	2.4 Collaborating through digital technologies	I have learned different negotiation strategies, effective team-building and collaborative working strategies. I have also learned how to build and sustain the group dynamics and effective monitoring skills.	342
	2.5 Netiquette	Definitely! For example, during our chatting in our whatsapp group, I used an exclamation mark which can easily be understood in a negative way.	16

(*continued*)

Table 6.1. Continued

Codes	Sub-Codes	Examples	Frequency
	2.6 Managing digital identity	I can't say I did, except for using Moodle. I already knew how to use it as we use the same platform for our university courses but I learned some features, such as putting details and media on your profile.	2
3. Digital content creation	3.1 Developing digital content	I found useful the procedure we have to follow to make a VE project (collaborative task etc.)	70
	3.2 Integrating and re-elaborating digital content		0
	3.3 Copyright and licenses		0
	3.4 Programming		0
4. Safety	4.1 Protecting devices		0
	4.2 Protecting personal data and privacy	Google Site was new to me. However, I am very careful with Google&Co because of data privacy	2
	4.3 Protecting health and well-being		0
	4.4 Protecting the environment		0
5. Problem solving	5.1 Solving technical problems	sometimes it's hard to understand what they say because of bad internet connections, but it can be fixed with just asking them to repeat what they said.	2

Table 6.1. Continued

Codes	Sub-Codes	Examples	Frequency
	5.2 Identifying needs and technological responses	I think I could start using iPads more in teaching English because there are more and more refugees coming from Ukraine and it would be nice to put them in pairs with their Slovenian peers – in this case they could use Google translate, especially in lower classes.	111
	5.3 Creatively using digital technologies	Yes, because we designed a great game to use later on in our on class. We get to know some great tool to create new games and can also use the games form the other groups as inspiration.	55
	5.4 Identifying digital competence gaps	I'd love to be more skilled in game programming, so that I can implement improvements in the outcomes by myself, without having to add "I don't know if it is possible, but can you make this/that?"	15
6. Other learning or achievements		I learned that I am able to collaborate with teachers and student teachers from different European countries productively. I realized that my teaching experience could be valuable for someone.	1534
7. General comments		The final moment of presenting our part of the booklet was very touching for me.	958
8. Denying any learning		I have not learned any new about technology, but I have confirmed that my choices are correct.	171
9. Suggestions		Each group is made up by two students and two teachers. In my group, both teachers have little experience. It would be interesting to combine newcomer teachers with ones with more experience.	342

(*continued*)

Table 6.1. Continued

Codes	Sub-Codes	Examples	Frequency
10. Problems		What is proving more difficult is keeping up with all of the tasks sent as part of the exchange, for we are sometimes asked to prepare or complete certain activities upon short notice and this clashes with other projects/activities from other subjects.	222
11. Uncertain		The students are working on the topic. We only asked them to work on a certain topic/content.	87

Main Qualitative Findings and Discussion

RQ2. What areas and sub-competences are the most developed in VE according to participants' perceptions?

In answer to RQ2, qualitative analysis of the data indicated that, according to participants' perceptions, six main themes or sub-competences within the DigComp 2.1 Framework were developed through engagement in VALIANT's VEs: (1) interacting through digital technologies, (2) sharing through digital technologies, (3) collaborating through digital technologies, (4) identifying needs and technological responses, (5) developing digital content, and (6) creatively using digital technologies. Table 6.2 depicts the frequency with which these competences were referenced by participants' responses to the open-ended questions.

Table 6.2. Most frequently referenced sub-competences

Theme (Sub-Competence)	**Number of times referenced by participants**
Interacting through digital technologies	547
Sharing through digital technologies	393
Collaborating through digital technologies	342
Identifying needs and technological responses	111
Developing digital content	70
Creatively using digital technologies	55

The frequencies referenced by participants above indicate that the VALIANT VEs primarily supported those sub-competences associated with communication and collaboration in area 2 in the DigComp 2.1 framework (i.e., interacting, sharing and collaborating) as well as sub-competences associated with problem solving (area 5) and digital content creation (area 3). In contrast, and as expected, the VEs proved less likely to support development of sub-competences associated with safety (area 4) such as protecting personal identity and privacy, managing digital identity or those associated to information and data literacy (area 1) such as managing data, information and digital content. This outcome stems in part from the focus of the VEs themselves, none of which included specific tasks on digital identity, internet privacy, or data management. In contrast, many VALIANT VEs did incorporate tasks that were designed to have participants interact, share and collaborate on the development of materials or to reflect on how these materials and technologies could be integrated into their teaching.

VEs with a specific emphasis on learning to use technologies in the classroom were also found to account for the perceived development of one of the sub-competences in particular (i.e., creatively using digital technologies). These three VEs (i.e., Setting up a Virtual Exchange for your pupils; Using Gamification in Foreign Language Teaching; and Integrating Technologies in the Foreign Language Classroom) involved tasks and learning outcomes that required creative development of teaching materials or lessons using technology or digitally mediated practices. In contrast, in VEs in which technology was incidental and not integral to the topic (i.e., Defining Professional Spaces in Different Educational

Contexts), creatively using digital technologies was not identified at all as a sub-competence that had been developed by participants.

The analysis of the qualitative data also revealed that participants demonstrated they could interact effectively through a variety of digital technologies which led to a perceived increase in their understanding of how to use appropriate digital communication methods within diverse contexts. This overarching theme is also manifested in their familiarity with new tools and their ability in navigating multiple platforms. Notably, participants highlighted their improvement in utilising various tools effectively for addressing specific pedagogical objectives, such as triggering engaging class discussions and facilitating active learning experiences that pertained to the students' interests, as exemplified by this comment from one of the VE participants:

> *I have realized that tools like Etherpad that are simple can be used to get an overview of discussed topics and to get everyone active at the same time. I also go to know open, creative, interactive and stimulating virtual tool such as Nearpod and Gather. town that seem useful and interesting for classes*.

Another outstanding theme that emerged in the analysis was the participants' enhanced capability to share effectively using digital technologies. By sharing we refer not only to the exchange of data, information, and digital content (such as websites) but also of ideas, perspectives, knowledge, and experiences with others through suitable digital media. This opportunity to share in the VEs was proven to be highly beneficial, as it did not only enhance the participants' perceptions of their digital competence but also their motivation to engage their own students (present and future) in using digital tools. The importance of having the opportunity to share is illustrated in the following quote from one of the participants:

> *Since taking part in the Virtual Exchange I tried many different technologies that I learnt about from other students and teachers. It is very useful to share ideas and apps we use because students are more motivated for work when they see something new.*

Another important finding had to do with collaboration mediated by digital technologies. As with sharing, the participants' abilities to collaborate using digital technologies were also significantly developed. This specific sub-competence encompasses the ability to effectively utilise digital tools

and technologies to engage in collaborative processes, as well as to jointly construct and create resources and knowledge. This is particularly noticeable in the participants' ability to engage in online interactions with individuals from diverse cultural backgrounds, as well as in their ability to co-create digital artefacts such as an e-booklet or a digital lesson plan. The following two quotes illustrate participants' perceptions regarding this aspect:

> *I have learned how to collaborate with people from other countries using different online tools.*
> *As a teacher educator, I was amazed at how professionally pre-service teachers produced the e-booklet. The collaboration between pre-service and teachers in the study was quite efficient. Their engagement in the e-booklet preparation was a rewarding professional experiential learning experience for the pre-service teachers as they had a chance to co-construct pedagogical knowledge as a joint endeavor with their peers and their mentors (teachers).*

An unexpected theme in the participants' perceived development of digital competence was their enhanced ability to identify needs and technological responses. This sub-competence was not initially a targeted objective in the surveys but emerged in the analysis as an interesting outcome. It refers to the ability to assess needs, evaluate and select digital tools, and identify appropriate technological solutions to address them effectively. After engaging in VE, participants acknowledged their personal limitations and recognised the importance of acquiring specific digital skills, such as recording and editing digital media products. They also acknowledged the significance of selecting suitable digital tools to achieve specific pedagogical objectives, such as motivating students and facilitating learning. This finding is illustrated in these two quotes:

> *I'm totally aware that I need training about recording and editing videos.*
> *This Virtual Exchange has made me realise how important it is to improve my digital skills in order to know how to apply technology in class in a proper way since technology can be a really powerful tool to motivate students and help them in their learning process.*

Furthermore, another important theme that emerged was the participants' perceived development in creating digital content. Creating digital content includes an ability to effectively create and edit digital content in various formats, as well as an ability to express oneself effectively through

digital means. The participants perceived that their competence and their positive attitude towards utilising digital tools had developed when carrying out tasks such as developing lesson plans that integrated technologies or when incorporating emerging technologies such as gamification into their instructional processes. The following quotes exemplify their positive attitudes towards this competence and perceptions of competence development:

> *Yes, I enjoyed the idea of creating a lesson with technological devices, gadgets, etc. …we saw how to create a game completely online with unity which made it really interesting and I would like to try that out in the future.*

A final noteworthy theme revolves around the participants perceived development in their ability to creatively use digital technologies. More specifically, this ability encompassed their ability to employ digital tools and technologies for knowledge creation and process or product innovation. An example of this finding is a shift from relying on printed materials to utilising digital media for collaborative projects with students, which are then shared within the school community. This quote demonstrates this aspect:

> *I have given this example far too many times, but for a teacher who has gone paperless in her classrooms, learning new tools to use in my classes is always a plus. My experience using gentil.la was nonexistent and now I can work with it in my classes and with my students. This year, from a different project I learned about two websites and I used them to publish my students' work and publicize it among the school community.*

The aforementioned examples demonstrate that participation in VEs has proven beneficial for both teachers and student teachers. Both groups have shown noticeable development in most of the sub-competences included in the DigComp 2.1 framework, along with an enhanced digital attitude and motivation to engage with digital tools and navigate various online platforms to achieve their pedagogical goals.

In addition to digital competence development, we aimed to capture additional learning gains related to technology that are not explicitly mentioned in the DigComp 2.1 framework (see these additional codes in Section 4 of this chapter). These gains included participants acquiring knowledge and engaging in a process of reflection on technology in the current era. For instance, participants reflected on the terms *digital native*

and *digital immigrant*, challenging the notion and recognising that anyone can learn to use technology tools irrespective of their age. They acknowledged the importance of providing guidance to students, even if they had prior experience with technology. These reflective discussions were facilitated by the interactions between teachers, student teachers, teacher educators, and invited educational experts during the VEs. The following quotes highlight how the participants actively engaged in insightful reflective discussions regarding current technology-related topics:

> *"Digital natives" and "multitaskin" are myths that have a great impact on how we concieve education. Digital competency needs to be developed like any other and it has nothing to do with the individual's age. Such conceptual determinism generates a vicious cycle in the educational system that results in teachers not being prepared to integrate technology in a purposeful and contextualized manner in their lesson planning. Moreover, it implies that students are not recieving the training that they need in order to use digital tools and devices essential to their future academic and professional lives.*
> *I enjoyed reading the article about digital natives and digital immigrants which made me realise that both terms are a myth and that it is ok if you cannot multitask or that everybody, regardless of their age, can learn how to use digital tools.*

Furthermore, participants also reflected on the lasting effects of the COVID-19 pandemic and how it has affected their perception of the benefits of technology in teaching. They realised that these benefits should be sustained beyond the COVID-19 pandemic rather than be considered as obsolete and therefore discarded. One of the participants mentions:

> *As aforementioned, it helped me become much more aware of my role as a teacher. Furthermore, it convinced me that a mixture of online and offline methods could be highly desirable, even in a post-pandemic world. This has been quite the shift for me since I originally thought that after COVID-19 these methods would just be abandoned since they were more replacements for their face-to-face counterparts than active improvements on our teaching methods.*

Several comments from participants highlighted their acknowledgement of enhanced digital competence as a result of their participation in the VEs. While a few participants mentioned that they did not learn anything new specifically related to their digital literacy, it is important to note that even in those rare cases, participants still found value in their participation. They discovered new features of the tools they were already familiar with or benefited from the theoretical perspectives covered in the VE.

These instances demonstrate that participants were able to deepen their understanding and make meaningful connections between prior and newly acquired knowledge, thus further enhancing their digital competence. The following quotes illustrate these instances:

> *So far we have not used many online tools and the ones we used I was already familiar with. Nevertheless, I was able to get to know some more features such as recording a Zoom session.*
> *I thought I was going to learn something new, instead, I ended up sharing things I already know. The theoretical part was of utmost interest though!*

Overall, the examples provided in this chapter suggest the positive impact of VEs on the development of digital competences and digital attitudes among teachers and student teachers, while also fostering knowledge acquisition and critical reflection on technology and its role in education in the 21st century. Certain findings also suggest an influence of the focus of the VE and the specific type of digital sub-competences that are likely to develop.

Conclusion

In conclusion, this study strongly supports that VE is an effective practice for promoting the development of digital competence and digital attitude in the contexts of Initial Teacher Education and Continuous Professional Development. Through its interactive nature, VE programs can provide individuals with valuable opportunities to engage in cross-cultural communication, collaborate on digital projects using a wide range of tools, and navigate diverse online platforms. This study highlights and illustrates numerous of such positive effects.

Firstly, participants perceived notable improvements in their ability to navigate online networks, enabling them to effectively collaborate with other educators, develop digital resources and knowledge, and advance professionally. Additionally, engagement in VE appeared to enhance the digital attitude of both teachers and student teachers, even among those who initially held a positive mindset toward digital technologies. This

enhanced digital attitude was evident through the participants' increased value placed on digital technologies and their willingness to employ them, as well as their eagerness to involve their students in online collaborative projects.

Furthermore, VE played a significant role in developing specific sub-competences, primarily related to interacting, sharing, and collaborating in digital spaces, identifying needs and appropriate digital responses, as well as creating digital content and creatively using technology. These outcomes can be attributed to the integration of tasks within the different VEs which focused on providing participants with opportunities to engage in meaningful interaction and collaboration.

Overall, VE has demonstrated its effectiveness in fostering digital competence through online international communication and collaboration, and in promoting a positive digital attitude. These findings underscore the significance of incorporating VE programs into educational settings to equip both teachers and student teachers with the necessary skills set and mindset for success in the current educational context.

References

DigComp Framework 2.1. (2017). Carretero Gomez, S., Vuorikari, R., & Punie, Y. (2017). *DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use*. Luxembourg: Publications Office of the European Union.

Educause Horizon Report. Teaching and learning edition (2021). Available at https://library.educause.edu/resources/2021/4/2021-educause-horizon-report-teaching-and-learning-edition. Boulder, CO: EDUCAUSE.

EVOLVE Project Team (2020). *The Impact of Virtual Exchange on Student Learning in Higher Education: EVOLVE Project Report*.

Hafner, C. A., & Chik, A., & Jones, R. H. (2015). Digital literacies and language learning. *Language Learning & Technology, 19*(3), 1–7. http://dx.doi.org/10125/44426

Hauck, M., & Kurek, M. (2017). Digital literacies in teacher preparation. In S. Thorne, & S. May (Eds.), *Language, education and technology: Encyclopedia of language and education* (3rd ed., pp. 275–287). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-02237-6_22

Hauck, M., & Satar, H. M. (2018). Learning and teaching languages in technology-mediated contexts: The relevance of social presence, co-presence, participatory literacy and multimodal competence. In R. Kern & C. Develotte (Eds.), *Screens and scenes: Online multimodal communication and intercultural encounters: Theoretical and educational perspectives* (pp. 133–157). London: Routledge. https://doi.org/10.4324/9781315447124-7

Helm, F., & van der Velden B. (2021). *Erasmus+ Virtual Exchange – Intercultural learning experiences – 2020 impact report*, Publications Office, https://data.europa.eu/doi/10.2797/870428

Hubbard, P. (2008). CALL and the future of language teacher education. *CALICO Journal*, *25*(2), 175–188.

List, A. (2019). Defining digital literacy development: An examination of pre-service teachers' beliefs. *Computers & Education, 138*, 146–158. https://doi.org/10.1016/j.compedu.2019.03.009

The EVALUATE Group. (2019). Evaluating the impact of virtual exchange on initial teacher education: a European policy experiment. Research-publishing.net. https://doi.org/10.14705/rpnet.2019.29.9782490057337

Vinagre, M. (2017). Developing teachers' telecollaborative competences in online experiential learning. Special Issue on Telecollaboration. *System*, *64*, 34–45. https://doi.org/10.1016/j.system.2016.12.002

Begoña F. Gutiérrez & Jekaterina Rogaten

7. Impact of Virtual Exchange on teachers' and student teachers' intercultural competence

Introduction

This chapter explores participants' development of intercultural competence (Byram, 1997, 2020) as a result of their participation in the Virtual Exchanges (VEs) implemented as part of the VALIANT project. In recent years, several related models and frameworks that complement each other have emerged, such as the global competence models (UNESCO, 2014; OECD, 2018), the model of competences for democratic culture (Council of Europe, 2016) or frameworks for intercultural citizenship (Deadorff, 2006; Risager, 2007; Byram, 2008). In short, all these models of intercultural or global competence or citizenship, although presenting differentiating nuances, focus on the development of knowledge, skills, attitudes and values to communicate and act effectively and appropriately in different cultural contexts. The basic difference between the concepts of competence and citizenship can be found in the element of action taking of social action.

In contexts of intercultural communication using a foreign language, as was the case for the VALIANT participants, the development of what is known as intercultural communicative competence has become increasingly relevant in past 30 years. Publications such as "Context and Culture in Language Teaching" by Kramsch (1993) or "Teaching and Assessing Intercultural Communicative Competence" by Byram (1997) dealt with the relevance of preparing people to cope successfully with establishing and developing intercultural relations with people who have a different set of beliefs, world views and practices from their own while using a foreign language for communication. Byram (1997) deliberately built on Hyme's (1972) concept of communicative competence by adding the intercultural dimension. According to this model, the educational goal was to become

a successful 'intercultural speaker' and to move away from the unrealistic idea of the native speaker as a model (Chun, 2015; Lindner, 2016).

Numerous research studies over the past decades have explored and acknowledged the value of online intercultural interaction and collaboration during VE for the development of intercultural competence (Belz, 2003, 2004; Furstenberg et al., 2001; Müller-Hartmann, 2007; Ware, 2005; Furstenberg & Levet, 2014; Chun, 2015; see Avgousti, 2018 for an overview; Vinagre & Esteban, 2019). However, intercultural learning does not simply happen via engaging in intercultural communication and collaboration; rather, the learning experience needs to be intentionally and carefully designed (Richardson, 2016). The inclusion of collaborative tasks (Helm & Van der Velden, 2019) that challenge VE participants with the need to negotiate and collaborate to accomplish the task together is instrumental in terms of developing intercultural skills. Furthermore, the challenges that arise as a result of engaging in such tasks have been shown to contribute to improved intercultural learning outcomes. Despite this, collaborative tasks tend to be the least frequently included in VE projects (Guth & Helm, 2010), which is likely to be due to their complexity. Another aspect that has been acknowledged as key in contributing to intercultural learning in VE is the teachers' role in offering pedagogical mentoring and support to students to reflect on and learn from their online intercultural interactions throughout the project (O'Dowd et al., 2020; Gutiérrez et al., 2021, 2022).

Given the context of the VEs implemented as part of the VALIANT project (i.e., engaging teachers and student teachers), it is worth noting the relevance that numerous studies have attributed to class-to-class VEs for initial teacher education (Dooly & Sadler, 2020; Wu, 2021). A strong argument for implementing such projects is based on the model of experiential learning (Vinagre, 2015; Grau & Turula, 2019). This approach suggests that if teachers participate as learners in such innovative educational experiences, they will find it easier and will be more likely to integrate VE into their own teaching in the future. In such contexts, teachers can develop their intercultural collaboration skills while learning innovative educational approaches and developing new international partnerships and educational initiatives. In this area, the EVALUATE project (Evaluating and Upscaling Telecollaborative Teacher Education), a large-scale study that was an Erasmus+ European Policy Experiment involving more than 1000 student teachers from 16 different countries, stands out. Initial

teacher education classes were paired and participated in VEs developed around tasks and content related among others to intercultural competence (The EVALUATE group, 2019). Another recent study engaging student teachers in VE to enhance their professional awareness can be found in Symeonidis and Impedovo (2023) where a VE project was designed and implemented with Austrian and French student teachers who were seen to develop appreciation of cultural diversity. At the same time, other recent studies (Nissen & Kurek, 2020; Stevens Initiative, 2020) have also found that VEs are key in providing teachers with learning experiences for professional development being intercultural competence one of the aspects to be developed.

Research Questions

The main objective of this chapter is to assess the effectiveness of VALIANT VEs on teachers' and student teachers' perceived gains in intercultural competence. Intercultural competence is seen as a core skill in the context of teachers' intercultural collaboration opportunities, ability to participate in online collaborative projects, and networks (i.e., eTwinning, Erasmus+ KA2 proposals). The main research questions for this investigation:

RQ1. To what extent does engagement in VE contribute to teachers and student teachers perceived intercultural competences development?
RQ2. What aspects of intercultural competence are perceived to be the most/least valued by the VE participants?

Teachers and student teachers completed identical surveys measuring perceived intercultural competence at the beginning of the VE (pre-VE survey) and at the end of the VE (post-VE survey).

To answer RQ1, the pre- and post-VE survey scores for each of the four intercultural skills were computed and the differences examined. To answer RQ2, the qualitative data from the open-ended questions in the pre- mid- and post-VE surveys were coded and analysed. Participants' answers to these questions allowed to identify the main themes emerging from the qualitative data set in terms of specific aspects of intercultural

competence development, thus supplementing the quantitative results. For a more detailed description of the surveys, data collection and analysis see Chap. 3 of this volume.

Main Quantitative Findings

Overall, the results showed that there was a significant perceived moderate increase in intercultural collaboration skills ($Md_{\text{pre-VE survey}} = 80$, $Md_{\text{post-VE survey}} = 85.4$, $z = -9.016$, $p < 0.001$, $r = -0.43$) and intercultural verbal and non-verbal behaviour ($Md_{\text{pre-VE survey}} = 75$, $Md_{\text{post-VE survey}} = 80$, $z = -0.31$). Furthermore, there was a small significant increase in intercultural perspective taking skills ($Md_{\text{pre-VE survey}} = 83.3$, $Md_{\text{post-VE survey}} = 86.8$, $z = -4.351$, $p < 0.001$, $r = -0.21$). There was no significant change in intercultural learning. Lack of perceived change in intercultural learning can be attributed to the initial high scores at the pre-VE survey ($Md_{\text{pre-VE survey}} = 95$) and as such, there was a sealing effect which is common and was observed in other similar research projects e.g., EVOLVE (EVOLVE Project Team, 2020) EVALUATE (Baroni et al., 2019) and EVE (Hemp & van der Velden, 2021).

The results also showed that there was no change in any of the intercultural skills in the control group. Therefore, these results indicate that any perceived change reported by the participants is due to the VE experience and unlikely to happen by chance. Furthermore, the results were largely consistent across all three rounds of the exchanges highlighting the stability and replicability of the findings.

The pattern of the perceived gain in three intercultural skills was consistent in both teachers and student teachers. Teachers showed significant moderate improvement in intercultural collaboration ($Md_{\text{pre-VE survey}} = 85$, $Md_{\text{post-VE survey}} = 88$, $z = -3.922$, $p < 0.001$, $r = -0.29$) and behaviour ($Md_{\text{pre-VE survey}} = 80$, $Md_{\text{post-VE survey}} = 84.3$, $z = -0.29$), and small significant change in perspective taking ($Md_{\text{pre-VE survey}} = 86.7$, $Md_{\text{post-VE survey}} = 90$, $z = -2.043$, $p < 0.05$, $r = -0.15$). Student teachers showed similarly significant moderate improvement in the intercultural collaboration ($Md_{\text{pre-VE survey}} = 76.5$, $Md_{\text{post-VE survey}} = 83.3$, $z = -8.148$, $p < 0.001$ $r = -0.51$), followed

by only small change in intercultural behaviour ($Md_{pre\text{-}VE\ survey}$ = 70.3, $Md_{post\text{-}VE\ survey}$ = 76.3, z = -5.216, $p < 0.001$, r = -0.33) and small change in perspective taking ($Md_{pre\text{-}VE\ survey}$ = 81, $Md_{post\text{-}VE\ survey}$ = 84, z = -3.830, $p < 0.001$, r = -0.24). These results are summarised in Figure 7.1.

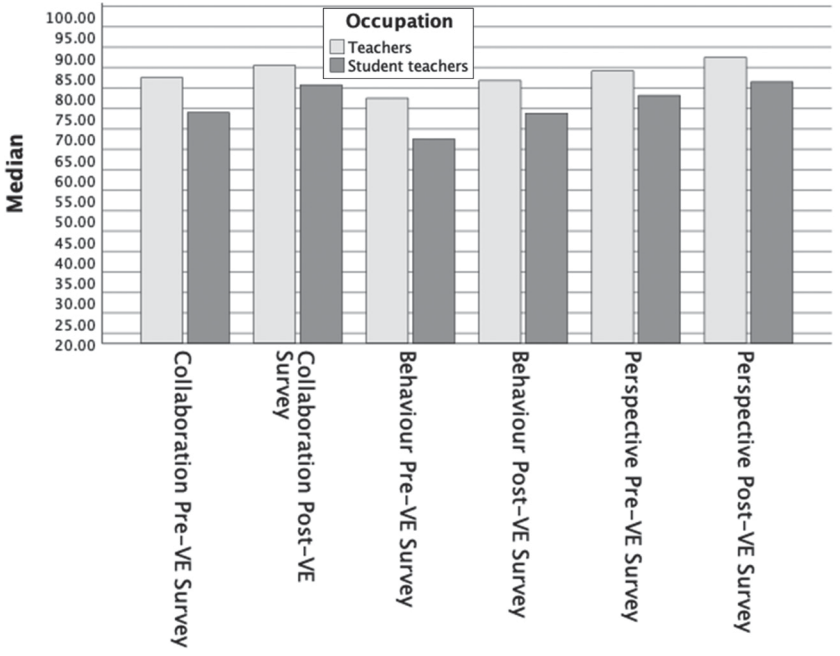

Figure 7.1: Development of intercultural skills for teachers and student teachers

VE type (teachers only, student teachers only, and mixed teachers with student teachers) had almost no effect on the development of the intercultural skills and was consistent and significant in all VE types. The results are summarised in Table 7.1 below. Moderate improvement across all the VE types was noted in intercultural collaboration. Intercultural behaviour was moderately improved in the VEs where teachers collaborated with other teachers or with student teachers. Perspective taking was moderately improved in the VEs where teachers collaborated with other teachers and less so (but still significantly) in other types of the VEs.

Table 7.1. Results of the Wilcoxon Signed Rank tests for the different VE types

VE type	**Statistics**	**Collaboration**	**Behaviour**	**Perspective**
Teachers with Student teachers	$Md_{Pre\text{-}VE\ survey}$	82.5	76.7	84.0
	$Md_{Post\text{-}VE\ survey}$	87.5	80.3	87.0
	z	-6.458	-4.617	-2.897
	p	<.001	<.001	<0.01
	r	-0.4	-0.28	-0.18
Student teachers only	$Md_{Pre\text{-}VE\ survey}$	70.9	67.8	79.3
	$Md_{Post\text{-}VE\ survey}$	81.8	73.0	84.7
	z	-5.538	-3.239	-2.386
	p	<.001	<0.001	<0.01
	r	-0.54	-0.31	-0.23
Teachers only	$Md_{Pre\text{-}VE\ survey}$	82.5	76.7	84.7
	$Md_{Post\text{-}VE\ survey}$	86.0	82.0	90.0
	z	-2.939	-3.379	-2.478
	p	<0.01	<.001	<0.05
	r	-0.36	-0.41	-0.3

Note: Md – Median

Overall, the results of the quantitative analysis showed that VE can help teachers and student teachers to develop mainly intercultural collaboration and verbal and non-verbal behaviour, and less so perspective taking (small effect size indicative of little practical significance). There was no change in any of the intercultural skills in the control group and there was no change in intercultural learning. All participants scored very high in intercultural learning prior to the start of the exchange and that could have affected the results. Thus, in relation to the RQ1, the VALIANT VEs contributed to the perceived increase in three out of four intercultural skills.

In addition, quantitative data analysis showed that the most perceived improvement was in the area of intercultural collaboration. However, to better understand the impact of the VEs on the development of intercultural skills, it is important to look more in-depth at the participants' qualitative data that captured their experiences and learning through the

open-ended questions in the surveys. In addition, qualitative data analysis will also help us to understand if there are other important areas of intercultural development that VE facilitates, and the quantitative survey failed to capture. Thus, qualitative data analysis will be triangulated with the quantitative data analysis to further expand answers to RQ1 and RQ2.

Framework for Qualitative Analysis: Codebook

For the analysis of the qualitative data, NVivo was used to support the coding process. The codes established for the analysis of intercultural competence development were created with reference to Byram's (1997, 2020) core intercultural competence model of attitudes, skills and knowledge since it has been widely used to examine the learning outcomes of VE. At the same time, the coding also focused on issues that were identified during the process of analysing the dataset, labelled as "new codes" in the table below. These included rejection of cultural learning and increased awareness of the value of online intercultural collaboration. The following Table 7.2 presents the codebook established for the analysis with its respective codes and subcodes.

Table 7.2. Intercultural Competence Codebook

CODE	SUB-CODE	EXAMPLE	FREQUENCY
Intercultural Competence	Learning about cultural products and practices	And it was really nice to learn about the different educational systems in the different countries. We also had two teachers from Scandinavia, which was really interesting because they are said to be quite good.	57
	Online intercultural collaboration skills	What we've learned from the experience is how to identify each person's strengths and use that in our favour to better our collaboration.	51
	Interest in learning about other cultures / other professional perspectives	Intercultural interaction unfolded during this exchange has further boosted my interest to communicate and collaborate with people from other cultures.	42
	Perspective-taking	And of course, discussing things from different perspectives and learning to agree or to disagree was one of the main things that we took away from this as well.	34
	Soft skills (apart from intercultural competence)	Collaborating with fellow German student-teachers, and with German and Italian teachers, in my working group has seen me continue to develop soft skills such as time management, giving feedback, efficient communication, and intercultural awareness. It has brought to my attention different ways of planning and organising one's time, notions of efficiency and expectations from academic meetings.	23

Table 7.2. Continued

CODE	SUB-CODE	EXAMPLE	FREQUENCY
	Behavioural aspects (changing behaviour and communication style according to cultural background of interlocutors)	I have learnt to identify diverse communication styles, my German colleagues being more direct, pragmatic and analytical, my Spanish and Italian colleagues producing more inference-based, abstract and motivational messages. Such a finding proved interesting to enhance my assertiveness and manage my cross-cultural public speaking skills.	14
New codes	Rejection of cultural learning / I have nothing to learn, etc…	I don't think the project has strongly impacted my interaction with people from other cultures. But this is probably due to the fact that I have already had a lot of contact to people from other cultures during stays abroad. However, the project showed my once more how valuable intercultural exchange is.	44
	Awareness of the value of online intercultural collaboration	I think it is important to improve your work through such exchange programmes and working together with different people. The impact will be that I want to participate as well as a teacher.	18

However, it should also be noted that trying to assess intercultural competence development poses some ethical issues such as difficulties in assessing "internal outcomes" (e.g., personal growth and maturity) and the contextual nature of these internal competences (Borghetti, 2017).

Main Qualitative Findings and Discussion

Based on the analysis of the qualitative data, 5 main themes were identified according to the participants' perceived skill development. These included: (1) perceived intercultural learning, (2) perceived intercultural collaboration skills development, (3) perceived intercultural perspective taking, (4) perceived intercultural behaviour and (5) perceived increased awareness of the value of online intercultural collaboration in education.

Perceived Intercultural Learning

Perceived intercultural learning can be defined as VE participants' perceptions in terms of increased knowledge and interest about cultural products and practices. It was identified in those statements where VE participants showed to have learned factual aspects about different cultures or educational systems as well as interest in learning about other cultures and/or other professional perspectives.

In this regard, participants frequently reported having acquired increased knowledge and awareness of cultural differences and similarities in terms of educational practices and approaches. Reflections on education systems, teaching contexts and practices, common or similar problems or challenges in teaching and learning abounded in the data set:

> *I have learned about various cultural responses to different situations: the different ways teachers in Germany, Sweden, etc. have responded to COVID-19 and adjusting teaching around that, as well as the resources, or lack of, the different countries have for special needs teaching, and how different school security is compared to America. I have learned the topics about the education system of Brazil, the way they teach English, their English Language teaching programme and so on. By discussing these topics with distant partners, it influenced me and contributed a lot to me on how I can teach English to learners from different backgrounds.*

As could be seen in quantitative analysis (earlier in this chapter) participants perceived they improved intercultural learning the least (e.g., no significant change). This was largely due to the fact that, prior to the VE, participants had an average score of 90 on a 100-point scale with little room for improvement. The qualitative data provides further information

as to why this was the case. Especially in relation to the question "Has your Virtual Exchange project impacted on how you interact with people from other cultures?" Numerous examples could be identified where participants reported not having learned or not having anything new to learn from intercultural interaction. Participants' perceptions in these statements revealed the widely held belief that intercultural competence is a skill that can be "learned" instead of a lifelong learning process. This was evident in the reasons individuals provided to justify their claims, such as:

Previous international mobility experiences:

> *I was an Erasmus student, I learned a lot about different cultures, so this is not really new to me.*

Having lived in multicultural societies:

> *I was used to being friends with people from different cultures before, so it was familiar territory.*

or having participated in online projects before:

> *As it's not my first VE, I can't say this has had that big of an impact.*

O'Dowd (2023) in reflecting on this phenomenon explains that the situations in which participants "reject" or "undervalue" intercultural learning as a result of the online intercultural collaboration experience constitute a limitation to the learning process. While intercultural learning will vary and will have different impacts on individuals depending on their previous intercultural experiences as the above-mentioned examples illustrate, they should still be encouraged to develop openness and curiosity to cultural difference. Therefore, VE participants should be taught that intercultural competence is to be approached by individuals as a lifelong learning process.

At the same time, another theme that emerged from the qualitative data set was rejection of cultural learning arguing that "deep down we are all the same":

> *We are all people after all, so nothing is different.*

This tendency of participants in VEs to resort to minimisation of difference (Bennett, 1993) in their argumentations has been already identified

in previous research as a negative outcome of online intercultural collaboration (the EVALUATE group, 2019; O'Dowd, 2021).

Perceived Intercultural Collaboration Skills

Perceived intercultural collaboration skills development was identified in those statements in which VE participants reported what they learned about collaborating online in intercultural groups. Roy (2012) identified the skills needed for working in virtual collaboration teams as involving relationship building, communication, collaboration, and technological skills. Similarly, Kolm et al., (2022) define intercultural collaboration skills as a skill set including "ICT, intercultural and cultural, communication and language, self-management and organization, collaboration, and domain-specific competences" (Kolm et al., 2022).

The quantitative analysis identified intercultural collaboration as the skill that showed the greatest overall improvement in all three rounds of implementation. The qualitative results corroborate this idea, as the development of online intercultural collaboration skills by VE participants was the second most frequently occurring code in the qualitative dataset. This resonates with the findings of other studies in the context of teacher education that have pointed to the potential of VE as an enabler for the development of competences related to intercultural collaboration (Waldman et al., 2016; Grau & Turula 2019; O'Dowd & Dooly, 2022).

Overall, participants demonstrated that they had developed their awareness of strategies for overcoming the challenges of online intercultural collaboration as the following example illustrates:

> *Sometimes I missed some more fluidity in the interactions. In order to improve these I found it helpful to stick less to the questions we "have to" ask, but be more flexible and try some smalltalk in order to break the ice at the very beginning of each meeting.*

The challenges participants more frequently reported having to deal with were inherent to the communicative scenario (i.e., online and intercultural) and entailed issues such as managing and/or leading collaborative tasks, gathering the online group or handling issues such as time difference, varied priorities or one's own reaction under stressful situations. In response to these challenges, participants reported implementing strategies of a

varied nature such as the assignment of group roles, work division, collaborative decision making, time management or turn taking strategies. Participants also identified as effective being proactive and participative as well as prioritising communication (i.e., openly sharing ideas and thoughts). These strategies go in line with the characteristics of successful collaboration as identified by Vinagre (2015) characterised by "consistent participation, prompt communication, regular group discussion, timely and relevant contributions, and commitment to the task (task organisation, joint responsibility)" (p. 799).

Participants also referred to the importance of showing positive attitudes such as being cooperative or flexible and paying attention to the other's cultures and what they felt comfortable with. This is similar to the findings by Gleason and Jaramillo (2021) where a model of VE that focused on global collaboration was seen to encourage pre-service teachers to become culturally aware as well as to develop reflective and emotional skills such as empathy.

Perceived Intercultural Perspective Taking

Perceived intercultural perspective taking was identified in those statements showing the VE leading participants to become aware of other cultural or professional perspectives.

In terms of intercultural perspective taking, the quantitative results can be better understood looking at the qualitative findings. Participants' perceived improvement in intercultural perspective taking was significant but small in quantitative terms. This is reflected in the qualitative data where, in many cases, participants reflected on the intercultural experience as leading them to a re-evaluation of their own perspectives. However, while most participants reported having acquired a broader horizon or having become culturally aware, there was a lack of detail and argumentation on how perspectives changed. For instance:

> *The discussions with my colleagues made me rethink a lot of issues about my own culture.*

Another aspect that stood out regarding perceived perspective taking was referring to the experience as key to leaving behind the perception

of interaction and/or collaboration with partners from other cultures as something difficult, challenging or biased by prejudices. In this regard, the literature has suggested that receiving support or training during the VE about online intercultural communication and collaboration can be key in preventing learners from forming and/or helping them to overcome stereotypes or misconceptions about their international partners (Belz, 2003; Guth et al., 2012). At the same time, it has also been acknowledged that intercultural interaction per se does not ensure intercultural learning pointing to the importance of providing "culturally rich encounters" (Richardson, 2016) for participants to be able to engage with different cultures in meaningful ways that can allow them to reduce prejudices and stereotypes.

Teachers and student teachers reported how valuable it was for them to exchange ideas, challenges and practices with teachers from other cultures and to get to know new perspectives on teaching and learning. At the same time, participants signaled as key for the generation of new opinions as well as for the identification of common and differing points in their cultures and educational systems, being able to regularly engage in debating about different education-related topics of their interest. The following excerpt illustrates this:

> *Exchanging ideas with others of my line of work and learning new cultural aspects broadened my view on education.*

Perceived Intercultural Behaviour

The quantitative analysis also revealed small and significant improvement in intercultural verbal and non-verbal behaviour which can be defined as changing behaviour and communication style according to the cultural background of interlocutors (Bennett, 2017). The qualitative findings go in this line as behavioural aspects were found in the data set, yet they were not amongst the most coded themes. This could be because participants were not asked about this specific aspect and the references to it were proactively provided by individuals. Overall, participants mentioned paying attention to each other's body language, register or vocabulary use as well as to regulating one's own to reach communicative effectiveness. For example:

> *I've realised our body languages are different and I stopped using body language signals that belong to my culture only to increase the efficiency of the communication between us.*

VE has been seen in the literature as contributing to participants' awareness of intercultural communicative norms and styles (Godwin-Jones, 2019). In the VEs analysed, participants were indeed able to identify specific strategies such as turn-taking strategies, culture-specific expressions, gestures of dis/agreement, trying to make the deadlines and instructions clear by repeating, asking questions again or backtracking and switching wording so that their partners were able to better understand their ideas.

Teachers and student teachers also included references to intercultural behaviour in relation to their teaching, reporting that participating in the VEs helped them to become aware of the importance of adapting the communicative style to reach an intercultural audience accordingly:

> *I will modify my behaviour to fit an international setting going forward if my class contains people from other cultures.*

Perceived increased awareness of the value of online intercultural collaboration in education

Participants' reflections revealed an increased awareness of the importance of engaging in online intercultural interaction and collaboration. The arguments provided revealed that student teachers and teachers attached value to the experience both for themselves as participants for professional development:

> *As a teacher, I think it is important to improve your work through such exchange programmes and working together with different people.*

as well as for the students' learning:

> *I grasped the importance of such an experience and I decided to integrate similar projects into my lessons in the future*).

However, as Waldman et al. (2016) warn, while participating in VE tends to increase teachers' perceived self-efficacy and willingness to implement such projects, teachers will still need to test their perceived competence by facing actual implementation.

Another subtheme that emerged was the perceived value of such communicative scenario for participants' acquisition of confidence and willingness to engage in intercultural communication and collaboration:

> *I realised that international cooperation is not as difficult as one often thinks. I would like to do more projects like this. Now, I feel more willing and confident about communicating with other people from different cultures.*

This is in line with previous findings in the literature that acknowledge how VE contributes to shifting attitudes. Helm and Van der Velden (2020), for instance, in the Erasmus+ Virtual Exchange, 2019 Impact Report identified participants' gain in terms of curiosity, self-esteem and friendliness towards people of different ethnic and religious backgrounds as a result of their participation in VE.

Conclusion

It has been seen throughout the VALIANT project results, as well as in the literature, that participating in intercultural communication and/or collaboration does not ensure intercultural competence development (Leask, 2015). Therefore, to encourage this type of learning, educational institutions and educators should engage learners in carefully designed projects in which the intercultural experience moves beyond superficial comparison of cultural practices and requires international students to collaborate on meaningful tasks as well as to critically reflect on interculturality (Richardson, 2016; Helm & O'Dowd, 2020).

The main challenge to intercultural competence development identified had to do with participants' conceptions in relation to it. Both quantitative and qualitative data revealed how participants wrongly perceived it as a skill that is done or achieved. This is evident through lack of reported interest in intercultural learning in the quantitative data in particular. Therefore, the need to train individuals to recognise intercultural competence as a lifelong learning process has been identified.

Another misconception about intercultural learning was evident through participants' argumentations in which they resorted to minimisation of difference. This phenomenon, commonly reported as a negative outcome of VE, was termed by Ware and Kramsch (2005) as "the illusion of commonality". This could also be addressed by offering VE participants training in this aspect.

In contrast, the perceived development of online intercultural collaboration skills stood out in both quantitative and qualitative data sets. Overall, participants reported having developed their awareness of strategies for overcoming the challenges of online intercultural collaboration. Teachers and student teachers attached special relevance to the acquisition of intercultural collaboration skills for the teaching career referring to aspects such as willingness, confidence and ability to work in intercultural teams as well as to work collaboratively online and build high quality digital pedagogical materials.

Similarly, in the VEs analysed, participants also reported being able to identify specific strategies in terms of intercultural communicative norms and styles. In addition, teachers and student teachers both acknowledged the importance of intercultural behaviour in teaching. They have reported that participating in the VEs increased their awareness of the importance of adapting their communicative style to reach an intercultural audience.

In terms of perceived intercultural perspective taking, the VALIANT VEs helped participants to overcome stereotypes and misconceptions about their international partners. However, while participants reflected on the intercultural experience as leading them to a re-evaluation of their own perspectives, there was a lack of detail and argumentation on how perspectives changed. It would therefore be advisable in future VEs to try to encourage more explicit reflection in this regard if this aspect is to be explored.

Finally, participants' reflections also revealed an awareness of the benefits that engaging in online intercultural interaction and collaboration present for teachers. Participants valued the VE experience for helping them build their confidence and willingness to engage in intercultural communication and collaboration.

References

Avgousti, M. I. (2018). Intercultural communicative competence and online exchanges: A systematic review. *Computer Assisted Language Learning*, *31*(8), 819–853. https://doi.org/10.1080/09588221.2018.1455713

Baroni, A., Dooly, M., Garcés García, P., Guth, S., Hauck, M., Helm, F., Lewis, T., Mueller-Hartmann, A., O'Dowd, R., Rienties, R. & Rogaten, J. (2019) Evaluating the impact of Virtual Exchange on initial teacher education: A European policy experiment. Research-publishing.net. https://doi.org/10.14705/rpnet.2019.29.9782490057337

Belz, J. A. (2003). Linguistic perspectives on the development of intercultural competence in telecollaboration. *Language Learning & Technology*, *7*(2), 68–99. Retrieved from http://llt.msu.edu/vol7num3/belz

Belz, J. A. (2004). Learner corpus analysis and the development of foreign language proficiency. *System*, *32*(4), 577–591. https://doi.org/10.1016/j.system.2004.09.013

Bennett, M. J. (1993). *Towards ethnorelativism: A developmental mo del of intercultural sensitivity* (revised). In R. M. Paige (Eds.), *Education for the intercultural experience* (pp. 81–120). Yarmouth, ME: Intercultural Press.

Bennett, M. (2017). Development model of intercultural sensitivity. In Y. Kim (Eds.), *International encyclopedia of intercultural communication*. Wiley.

Borghetti, C. (2017). Is there really a need for assessing intercultural competence? *Journal of Intercultural Communication*, *44* (1). Retrieved from http://mail.immi.se/intercultural/nr44/borghetti.html

Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. Multilingual Matters.

Byram, M. (2008). *From foreign language education to education for intercultural citizenship: Essays and reflections*. Multilingual Matters.

Byram, M. (2020). *Teaching and assessing intercultural communicative competence: Revisited*. Multilingual Matters.

Chun, D. M. (2015). Language and culture learning in highereducation via telecollaboration. *Pedagogies: An International Journal*, *10*(1), 5–21. https://doi.org/10.1080/1554480X.2014.999775

Council of Europe. (2016). *Competences for democratic culture – Living together as equals in culturally diverse democratic societies.* Council of Europe.

Deardorff, D. K. (2006). Identification and assessment of intercultural competence as a student outcome of internationalization. *Journal of Studies in International Education*, *10*(3), 241–266. https://doi.org/10.1177/102831530628

Dooly, M., & Sadler, R. (2020). "If you don't improve, what's the point?" Investigating the impact of a "flipped" online exchange in teacher education. *ReCALL, 32*(1), 4–24. https://doi.org/10.1017/S0958344019000107

Gleason, B., & Jaramillo Cherrez, N. (2021). Design thinking approach to global collaboration and empowered learning: Virtual exchange as innovation in a teacher education course. *TechTrends*, 65(3), 348–358.

Velden, B., & Helm, F. (2020). *Erasmus+ Virtual Exchange – Intercultural learning experiences – 2019 impact report*, European Commission, European Education and Culture Executive Agency, Publications Office. https://data.europa.eu/doi/10.2797/513584

EVOLVE Project Team. (2020). The impact of Virtual Exchange on student learning in higher education: EVOLVE Project Report. https://pure.rug.nl/ws/portalfiles/portal/151666892/EVOLVE_project_report_impact_student_learning_Final_version_201222.pdf

The EVALUATE Group. (2019). Evaluating the impact of Virtual Exchange on initial teacher education: A European policy experiment. Research-publishing.net. https://eric.ed.gov/?id=ED593741

Furstenberg, G., Levet, S., English, K., & Maillet, K. (2001). Giving a virtual voice to the silent language of culture: The cultura project. *Language Learning & Technology*, *5*(1), 55–102. Accessed 26 September 2023 at https: //www.lltjournal.org/item/2342.

Furstenberg, G., & Levet, S. (2014). Cultura: From then to now. Its origins, key features, methodology, and how it has evolved. Reflections on the past and musings on the future. In D. M. Chun (Eds.), *Cultura-inspired intercultural exchanges: Focus on Asian and Pacific languages* (pp. 1–31). Honolulu, Hawaii: University of Hawaii, National Foreign Language Resource Center.

Godwin-Jones, R. (2019). Telecollaboration as an approach to developing intercultural communication competence. *Language Learning & Technology, 23*(3), 8–28. http://hdl.handle.net/10125/44691

Grau, M. K., & Turula, A. (2019). Experiential learning of telecollaborative competences in pre-service teacher education. *Language Learning & Technology, 23*(3), 98–115. http://scholarspace.manoa.hawaii.edu/handle/10125/44698

Guth, S., Helm, F., & O'Dowd, R. (2012). University language classes collaborating online. *A report on the integration of telecollaborative networks in European universities*.

Gutiérrez, B. F., Glimäng, M. R., O'Dowd, R., & Sauro, S. (2021). *Mentoring handbook for Virtual Exchange teachers. Strategies to help students achieve successful synchronous and asynchronous online intercultural communication*. Stevens Initiative https://www.stevensinitiative.org/resource/mentoring-handbook-for-virtual-exchange-teachers/.

Gutiérrez, B. F., Reljanovic Glimäng, M., Sauro, S., & O'Dowd, R. (2022). Preparing students for successful online intercultural communication and collaboration in Virtual Exchange. *Journal of International Students*, *12*, 149–167. https://doi.org/10.32674/jis.v12iS3.4630

Helm, F., & Van der Velden, B. (2019). *Erasmus+Virtual Exchange impact report 2018*. Publications Office of the European Union, Luxembourg. Retrieved from https://op.europa.eu/en/publication-detail/-/publication/a6996e6a9d2-11e9-9d01-01aa75e-d71a1/language-en/format-PDF

Helm, F., & O'Dowd, R. (2020). Virtual Exchange and its role in blended mobility initiatives. *UNICollaboration Position Paper*. https://www.unicollaboration.org/wp-content/uploads/2020/09/Position-paper-on-Blended-Mobility.pdf

Hymes, D. (1972). On communicative competence. *Sociolinguistics, 269293*, 269–293.

Kolm, A., de Nooijer, J., Vanherle, K., Werkman, A., Wewerka-Kreimel, D., Rachman-Elbaum, S., & van Merriënboer, J. J. (2022). International online collaboration competencies in higher education students: A systematic review. *Journal of Studies in International Education, 26*(2), 183–201. https://doi.org/10.1177/10283153211016272

Kramsch, C. (1993). *Context and culture in language teaching*. Oxford university Press.

Leask, B. (2015). *Internationalising the curriculum*. Routledge.

Lindner, R. (2016). Developing communicative competence in global virtual teams: A multiliteracies approach to telecollaboration for students of business and economics. *CASALC Review*, *5*(1), 144–156.

Muller-Hartmann, A. (2007). Teacher role in telecollaboration: Setting up and managing exchanges. In *Languages for Intercultural Communication and Education*, *15*, 167–192.

Nissen, E., & Kurek, M. (2020). *The impact of Virtual Exchange on teachers' pedagogical competences and pedagogical approach in higher education*. http://hdl.handle.net/11370/bb89998b-c08b-41f4-aee6-08faf1208433

OECD. (2018). *Preparing our youth for an inclusive and sustainable world.* The OECD PISA Global Competence Framework. https://www.oecd.org/pisa/Handbook-PISA-2018-Global-Competence.pdf

O'Dowd, R. (2021). Virtual exchange: Moving forward into the next decade. *Computer Assisted Language Learning, 34*(3), 209–224. https://doi.org/10.1080/09588221.2021.1902201

O'Dowd, R. (2023). *Internationalising higher education and the role of Virtual Exchange*. Taylor & Francis.

O'Dowd, R., Sauro, S., & Spector-Cohen, E. (2020). The role of pedagogical mentoring in Virtual Exchange. *TESOL Quarterly, 54*(1), 146–172. https://doi.org/10.1002/tesq.543

O'Dowd, R., & Dooly, M. (2022). Exploring teachers' professional development through participation in Virtual Exchange. *ReCALL*, *34*(1), 21–36. https://doi.org/10.1017/S095834402000215

Richardson, S. (2016). *Cosmopolitan learning for a global era: Higher education in an interconnected world*. Routledge.

Risager, K. (2007). *Language and culture pedagogy: From a national to a transnational paradigm*. Vol. 14. Multilingual Matters.

Roy, S. R. (2012). Virtual collaboration: The skills needed to collaborate in a virtual environment. *Journal of Internet Social Networking & Virtual Communities*, *2012*, 1–8. https://doi.org/10.5171/2012.629512

Stevens Initiative. (2020). Virtual exchange typology. The-Aspen-Institute. www.stevensinitiative.org/resource/virtual-exchange-typology/

Symeonidis, V., & Impedovo, M. A. (2023). Where internationalisation and digitalisation intersect: designing a Virtual Exchange to enhance student teachers' professional awareness as European teachers. *European*

Journal of Teacher Education, 1–19. https://doi.org/10.1080/02619768.2023.2243644

UNESCO. (2014). Global citizenship education: Preparing learners for the challenges of the twenty-first century. UNESCO. http://unesdoc.unesco.org/images/0022/002277/227729e.pdf

Vinagre, M., & Corral-Esteban, A. (2019). Tracing the development of intercultural competence in telecollaborative interaction: An analysis of evaluative language in eTandem exchanges. In Tardieu, C., & Horgues, C. (Eds.), *Redefining tandem language and culture learning in higher education* (pp. 95–112). London: Routledge.

Vinagre, M. (2015). Training teachers for virtual collaboration: A case study. *British Journal of Educational Technology*, *47*(4), 787–802. https://doi.org/10.1111/bjet.12363

Waldman, T., Harel, E., & Schwab, G., (2016). Getting their feet wet: Trainee EFL teachers in Germany and Israel collaborate online to promote their telecollaboration competence through experiential learning. In S. Jager, M. Kurek, & B. O'Rourke (Eds.), *New directions in telecollaborative research and practice: Selected papers from the second conference on telecollaboration in higher education* (pp. 179–184). Research-publishing.net.

Ware, P. (2005). "Missed" communication in online communication: Tensions in a German-American telecollaboration. *Language Learning & Technology*, *9*(2), 64–89. https://doi.org/10.1111/j.1540-4781.2005.00274.x

Ware, P. D., & Kramsch, C. (2005). Toward an intercultural stance: Teaching German and English through telecollaboration. *The Modern Language Journal, 89*(2), 190–205. https://doi.org/10.1111/j.1540-4781.2005.00274.x

Wu, S. (2021). Unpacking themes of integrating telecollaboration in language teacher education: A systematic review of 36 studies from 2009 to 2019. *Computer Assisted Language Learning,* 1–23. https://doi.org/10.1080/09588221.2021.1976800

Kelly Arispe, Euline Cutrim Schmid, Katja Kugler,
Meike Hähl & Jekaterina Rogaten

8. Impact of Virtual Exchange on teachers' and student teachers' professional development

Introduction

While the COVID-19 pandemic presented challenges to the teaching profession, it also catalysed a broader awareness of online opportunities for teachers to engage in professional development to support emergency remote teaching and learning. A recent systematic review of online professional development programs (OPD; Bragg et al., 2021) reveals that online opportunities for teacher development are on the rise and that they positively impact teacher self-efficacy and instructional practices in general. Moreover, they conclude that the common ingredient in successful OPD was teachers engaging in peer-to-peer discussion. In a similar manner, a recent meta-analysis by Kennedy (2016) suggests that successful professional development is characterised by focussing on content knowledge aligned to a broader goal and through collective participation where experts and non-experts work to achieve the goal, for example, to evaluate teaching strategies or develop lesson plans together. Peer-to-peer discussion and collaboration around a task are hallmarks of Virtual Exchange (VE) and, in this way, provide a rich environment to support teacher development. For example, O'Dowd and Dooly (2022) found that VE helped foreign language teacher educators evolve their teaching practices through innovative approaches.

The VALIANT VEs described in this book are clear examples where peer-to-peer discussion and collaboration position teachers and student teachers to exchange knowledge and experiences and engage in meaningful tasks to impact their current teaching practice or to prepare for their future profession. Previous chapters have addressed the affordances of VEs on teachers' motivation and feelings of isolation as well as their potential

to build critical competences in digital technology and intercultural communication. However, there are other important aspects of teacher professional development that have yet to be examined. Specifically, this chapter presents the perceived impact of VEs on self-efficacy, transversal skills development, and professional knowledge and attitudes about teaching and online professional networks. Furthermore, we consider student teacher growth compared to that of teachers to determine how these two groups are impacted differently and to what extent.

Review of the Literature

Teacher Self-efficacy

The concept of self-efficacy is a widely studied topic in psychology. According to Bandura (1997), self-efficacy refers to a person's belief in their ability to organise and carry out the necessary actions to achieve specific goals. Bandura (1997) explains that efficacy beliefs influence how individuals perceive opportunities and obstacles, how much effort they put into a task, and how long they persist in the face of challenges. According to Skaalvik and Skaalvik (2010), teacher self-efficacy (TSE) refers to the personal beliefs of individual teachers regarding their capacity to plan, organise, and successfully carry out activities that are necessary to achieve educational goals and can serve as a significant motivational factor that influences a teacher's effectiveness in the classroom. Several authors (e.g., Künsting et al., 2016; Bach, 2022) have pointed out that a teacher who possesses strong self-efficacy beliefs is likely to be resilient, adept at problem-solving, and, most importantly, capable of learning from their experiences.

According to Bandura (1997; 2006), people's beliefs about their capability of succeeding on particular tasks are influenced by four main factors: mastery experiences (own success experiences), vicarious experiences (observing others), verbal persuasion (verbal encouragement), and physiological and affective states (emotional reactions to specific tasks). Table 8.1 summarises these major sources, as defined by Bandura (op.cit.).

Table 8.1. Factors that contribute to self-efficacy

Factor	**Description**
Mastery experiences	If teachers believe their performance to be successful, efficacy beliefs are raised.
Vicarious experiences	When teachers see someone succeeding at something, their self-efficacy will increase; and where they see people failing, their self-efficacy will decrease.
Verbal persuasions	Encouragement can increase teacher self-efficacy, whereas negative feedback can weaken perceptions of teaching competence.
Emotional indicators	Teachers' perceptions of physiological indicators, such as stress or anxiety can markedly alter their self-efficacy.

Furthermore, it is suggested that fostering teachers' self-efficacy is crucial for cultivating effective, dedicated, and enthusiastic educators and this is especially important in recruiting and retaining teachers long-term. Bandura's self-efficacy theory not only encompasses individual beliefs but also extends to collective beliefs within groups. Collective efficacy refers to a group's shared belief in their collective capabilities to organise and execute actions necessary to achieve desired outcomes. In the teaching profession, collective efficacy plays a significant role as teachers operate collectively within an interactive social system. Bandura and subsequent studies (e.g., Donohoo, 2016; Goddard et al., 2000) have demonstrated that academic achievement is higher when teachers have belief in their collective abilities to influence student outcomes.

Transversal Skills

Online collaborative learning allows participants to practise interpersonal communication to accomplish a task. This requires skills like teamwork, time management, problem-solving, and negotiation (of ideas). These are some of the many transversal skills, sometimes referred to as "soft skills", that have been found to be critical to both employability and success in the workforce (Mourshed et al., 2014). Furhermore, transversal skills are essential for teaching and learning. In 2020, the *Assessment of Transversal Skills* (ATS) was created and co-funded by the Erasmus+ Programme of the European Union as an innovative policy experimentation to provide

guidance to teachers in assessing transversal skills in learners and, most importantly, to strategically target them in curricula. ATS defines transversal skills as "the ability to think critically, take initiative, use digital tools, solve problems, and work collaboratively" all of which are key ingredients to successful collaboration in the VALIANT VEs.

There are many ways to classify transversal skills and Cinque (2016) offers a helpful taxonomy that has been targeted and evaluated in the European Union (pp. 397–399). Skill development stands out as a primary method for teachers to build confidence in their profession, aligning with both self-efficacy and the broader significance of professional growth. Transversal skills that were analysed in this study were (1) team working, (2) negotiation of skills, (3) time-management, and (4) problem-solving.

Professional knowledge and attitudes about teaching

In addition to self-efficacy and transversal skills, research has also demonstrated the benefits for teachers who gain knowledge about innovative practices and can discuss approaches to dealing with the realities of the profession (Angelini & Muñiz, 2021; O'Dowd & Dooly, 2022). This is the case for continuous teacher development as well as for future teachers. For example, Dietrich (2022) found that VE challenged future teacher's assumptions about the profession while helping them anticipate how they can support students in challenging learning environments. In addition, their study also revealed that participants' perceived linguistic competence improved, suggesting that both teaching practices and content knowledge are outcomes of VE for future teachers. While certainly self-efficacy and transversal skill development are important elements of professional development, we also take an inductive approach to understanding knowledge and attitudes, to provide a comprehensive and thorough analysis for professional development gains in general.

Research Questions

The VALIANT project used both quantitative and qualitative data to analyse the perceived impact of VEs on teachers' and student teachers'

self-efficacy beliefs, transversal skills development, professional knowledge, and attitudes about teaching and online professional networks. The following research questions were considered:

RQ1. How did the engagement in VE contribute to the perceived development of teachers' and student teachers' self-efficacy?
RQ2. What transversal skills do teachers and student teachers perceive they gain as a result of VE?
RQ3. What were other perceived professional development gains in terms of knowledge and attitudes?

Quantitative Analysis

RQ1 included both quantitative (teachers only) and qualitative analysis collected from both teachers and student teachers. The answers to RQ2 were based on a quantitative analysis of both groups. Finally, RQ3 was analysed qualitatively for both groups.

To answer RQ1 and RQ2, the pre- and post-VE survey scores for self-efficacy, team working skills, negotiation skills, time management skills, and problem-solving skills were computed and compared to determine whether there was a perceived gain in self-efficacy and transversal skills following the completion of the VE experience. For a more detailed explanation of the survey and quantitative data analysis, see Chap. 3 of this volume.

Framework for Qualitative Analysis: Codebook

To answer RQ1, the data pertaining to teachers' and student teachers' self-efficacy were analysed qualitatively, and themes were formulated through a combination of deductive and inductive coding techniques (Braun & Clark, 2022). The following open-ended items from pre-, mid- and post-VE surveys were included in this analysis, specifically:

- What have you learnt about the topics that you have worked on? Has discussing them with distant partners influenced your understanding of the topics? If so, how?
- Has your Virtual Exchange project impacted on how you see your current work situation or your career? If so, how? If possible, give a concrete example to illustrate your answer.
- What have you learned from taking part in this Virtual Exchange?
- Did anything happen during this exchange which made a particular impact on you? If so, could you tell us about it?
- Has your experience in the Virtual Exchange influenced how you approach your teaching/teaching career or your continued studies as a student teacher? If possible, give a concrete example to illustrate your answer.
- Do you think the collaboration with teachers helped you to gain a better understanding of your future profession?

In the process of analysis, a total of eleven sub-codes were established (see codebook presented in Table 8.2. Six of these sub-codes (codes 1 to 6) were directly derived from the VALIANT survey items on self-efficacy. Furthermore, five sub-codes (codes 7 to 11) were generated from the collected data. These sub-codes were subsequently examined and categorised into two overarching themes: (a) enhanced confidence in the ability to teach effectively and (b) being able to take a broader, international or intercultural perspective in the teaching and learning context. All 11 self-efficacy sub-codes are presented below:

Where self-efficacy measurement tools are well established, other criteria related to VE teacher professional development and attitudes about teaching and online professional networks are not. As a result, an inductive approach was used to code qualitative data specific to RQ3. The same open-ended questions analysed for self-efficacy (referenced above) were considered for RQ3. Three main categories emerged such as professional knowledge, skills, and attitudes, and each had several sub-categories that were coded. Table 8.3 below presents the codebook that was used for analysis responding to RQ3, specifically.

Table 8.2. Codebook for self-efficacy qualitative analysis

CODE	SUB-CODE	Definition	EXAMPLE	FREQUENCY
Teacher self-efficacy	1. Developing more self-confidence in teaching	This code includes all statements in which participants reported that they developed more self-confidence in their capacity to teach	"I feel more confident now. I feel that my teaching methods are useful and the students can benefit from them." (In-service teacher)	Student teacher: 193 Teacher: 71
	2. Implementing alternative strategies in the classroom	This code includes all statements in which participants reported that they believe they can now implement alternative teaching strategies in their classrooms	"I learnt that every country is different, has its own education system, parents' expectations, values etc. I learnt that I would take part again because it was a lot of fun and very enriching. I learnt that I can also be a good teacher one day and that I don't always have to be too strict or assess everything the students say. I learnt that you sometimes have to make a move towards your students, so you can develop a better understanding for their struggles and needs." (Student-teacher)	Student teacher: 351 Teacher: 226
	3. Developing strategies to get students to work together	This code includes all statements in which participants reported that they believe they have acquired new strategies to get their students to work together	"I have learned different negotiation strategies, effective team-building and collaborative working strategies. I have also learned how to build and sustain the group dynamics and effective monitoring skills. I have realized how important it is to facilitate my group as a teacher educator in different ways" (In-service teacher)	Student teacher: 18 Teacher: 11

(*continued*)

Table 8.2. Continued

CODE	SUB-CODE	Definition	EXAMPLE	FREQUENCY
	4. Developing strategies to motivate students [who show low interest in their studies]	This code includes all statements in which participants reported that they believe they have acquired new strategies to motivate students [who show low interest in their studies]	"Yes, this virtual exchange influenced a lot my point of view regarding teaching. I realized that is very important to use some innovative strategies and technological tools in order to motivate the students with the subject." (Student teacher)	Student teacher: 47 Teacher:22
	5. Developing strategies to get community groups and any types of organizations involved in working with schools / institutions	This code includes all statements in which participants reported that they believe they have developed new strategies to get community groups and any types of organizations involved in working with schools	"Yes, especially in what regards developing our professional network. It is really good to meet lots of people that like us want to work in projects. Is not only good for us, but also for our students who benefit from these exchanges" (In-service teacher)	Student teacher: 57 In-service teacher: 44
	6. Helping colleagues/course mates with developing their teaching skills	This code includes all statements in which participants reported that they have acquired skills to help colleagues/course mates with developing their teaching skills	"[…] Our virtual partners have helped us to understand some concepts which we had no clue about, and vice versa […]." (Student-teacher)	Student teacher: 38 In-service teacher:31
	7. Confidence in analysing teaching and learning processes from different perspectives	This code includes all statements in which participants reported that they feel more confident in analysing teaching and learning processes from different perspectives	"Yes, especially when it came to designing the lesson plan, because listening to the ideas of my colleagues I saw how things could be done in different ways" (In-service teacher)	Student teacher: 272 In-service teacher: 163

	8. Reaching a better understanding of specific pedagogical concepts	This code includes all statements in which participants reported that the VE helped them to reach a better understanding of specific pedagogical concepts	"I have learned about a very useful approach, task-based learning, which I have always consider very effective. It has helped me to understand it much better and to learn about some steps to take in order to make it effective and profitable. Our virtual partners have helped us to understand some concepts which we had no clue about, and vice versa. I would say that it has been reciprocal and that we have learned many things from each other. They have shared with us their experience about real situations, how they implement certain techniques at school, things that do actually work, and others that do not, how students feel about them, etc. So, it is being a great opportunity to get some advice." (Student-teacher)	Student teacher: 77 In-service teacher: 49
	9. Developing more self-confidence for collaborating with their course mates/ colleagues	This code includes all statements in which participants reported that they developed more self-confidence for collaborating with course mates/colleagues	"It did have an impact. For example, when I have a video call with my partners, I am more willing to express my thoughts than before" (In-service teacher)	Student teacher: 206 In-service teacher: 104

(*continued*)

Table 8.2. Continued

CODE	SUB-CODE	Definition	EXAMPLE	FREQUENCY
	10. Enhanced confidence in (future) teaching due to awareness of common challenges	This code includes all statements in which participants reported that through the VE they realized that other course mates/colleagues face the same/similar problems/ challenges in the classroom	"[…] The exchange is giving me the feeling that I too can be a good teacher one day because we notice that everyone has their struggles, and we are all humans, and I don't have to be perfect in order to be a good teacher." (Student-teacher)	Student teacher: 73 In-service teacher: 110
	11. Having resources and networks for further learning	This code includes all statements in which participants reported that they gained resources and networks for further learning	"The exchange is definitely helping me to feel less isolated professionally and to develop my professional network. We exchange our views in our school, in our country, but it's always nice to have a wider perspective. I think institutions in our country (such as Ministry for education) aren't very responsive." (In-service teacher)	Student teacher:125 In-service teacher: 97

Table 8.3. Codebook for professional development qualitative analysis (attitudes, skills, knowledge)

CODE	SUB-CODE	Definition	EXAMPLE	FREQUENCY
Attitudes	Sense of a global teaching community	Statements that specifically refer to the value of a global/ international network of teachers	"I learned that in different countries we have the same problems and the same concerns with students the way we teach"	105
	Value of online collaboration	Statements that show the role of/attitudes towards building and maintaining networks	"Discussing the provided material by others from different backgrounds has helped me understand it a lot better as different aspects were pointed out"	62
Skills Development	Collaborating effectively in online networks	When participants mention how professional collaborative networks can be used as a source for one's own professional development	"I definitely feel that the exchange is helping me to build key competencies and abilities to build a network that I can reach out to for support during my training to become a teacher and as a future teacher. For instance, the relationship we are building with our fellow student teachers helps us develop our critical thinking, intercultural communication and creativity skills. In addition, in the future it will be useful to collaborate on innovative projects or research."	132
	Digital skills	Statements that show students' and teachers' awareness of their own digital skills and the importance of such for using technology in FLT	"This virtual exchange has made me realise how important it is to improve my digital skills in order to know how to apply technology in class in a proper way since technology can be a really powerful tool to motivate students and help them in their learning process."	18

(*continued*)

Table 8.3. Continued

CODE	SUB-CODE	Definition	EXAMPLE	FREQUENCY
	Personal Communication Skills	Statements that show that participants improved their communication skills / FL skills	My first impressions so far about the interactions are very nice, actually. I was excited to take part in this exchange, because I consider it the greatest opportunity to use effectively the language we have been learning and to improve our communicative skills. Also, it allows us to share different ideas and learn from our partners.	35
Professional knowledge	Realities of teaching	Statements that show how the VE led to a more realistic understanding of the profession and foreign language teaching at secondary schools	"It was great to get to know the insight of two teachers who have been of course already working a lot of years and have a lot of experience. They have countered some myths and explained how things really work in a school setting (the real world)."	55
	Characteristics of students- e.g., digital natives	When students and teachers mention that now they are more aware of their (future) students' digital skills (& the lack of such)	"We must be aware of the fact that we cannot take the students' knowledge of using digital devices and tools for granted. Students need guidance and training in order to learn how to use technology beneficially in class."	12
	Teaching methodologies / Classroom Practices	Statements that reference the value of learning several different teaching methodologies or a specific one like TBL	"I have learned many different ways of teaching and new methodologies."	66
	Digital tools	Statements that refer to tools, digital tools, apps, websites, etc.	"I've learnt so many things about online tools in such a short period of time and I'm looking forward to learning new tools like the eBook."	48

Main Quantitative Findings

RQ1: Perceived Gain in Self-efficacy

Overall, there was a significant moderate perceived improvement in self-efficacy among teachers ($Md^{[1]}_{\text{pre-VE survey}} = 65.4$, $Md_{\text{post-VE survey}} = 72.9$, $z = -5.685$, $p < 0.001$, $r = -0.44$). This improvement was consistent across all three rounds of exchanges indicating strong replicability of these results. Overall improvement in self-efficacy is demonstrated in Figure 8.1 below.

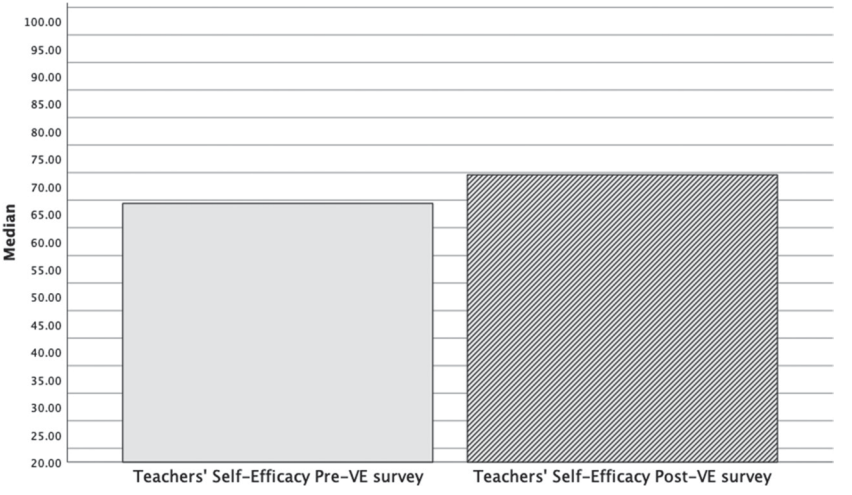

Figure 8.1: Overall perceived improvement in self-efficacy between pre- and post-VE surveys

Looking at the responses separately for each question, we noticed that perceived improvement in self-efficacy is related to collaborative engagement with outside organisations (other schools and universities) and motivating students who are low on engagement.

With regard to the type of VE (mixed teachers with student teachers or teachers only), teachers who collaborated with student teachers showed large significant improvement in their levels of self-efficacy ($Md_{\text{pre-VE survey}} = 64.5$, $Md_{\text{post-VE survey}} = 72.1$, $z = -4.988$, $p < 0.001$, $r = -0.52$). Teachers who collaborated with other teachers showed moderate significant improvement

in their self-efficacy ($Md_{pre\text{-}VE\ survey}$ = 69, $Md_{post\text{-}VE\ survey}$ = 74.2, z = -2.396, $p < 0.05$, r = -0.3). The results are summarised in Figure 8.2 below. It is important to note that self-efficacy was only mentioned for the teachers' sample. It was not possible to compare the results with the control group as it comprised student teachers only.

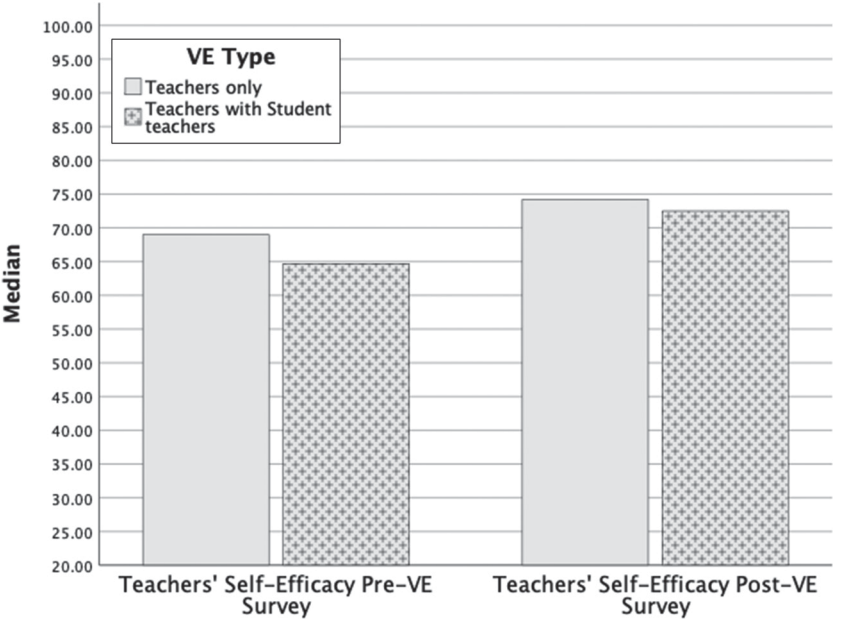

Figure 8.2: Improvement in perceived self-efficacy for two types of VE

RQ2: Perceived Gain in Transversal Skills

There was a small to moderate significant perceived improvement across all transversal skills (e.g., teamworking, problem-solving, time management and negotiation) in the VE groups. The results are summarised in Figure 8.3.

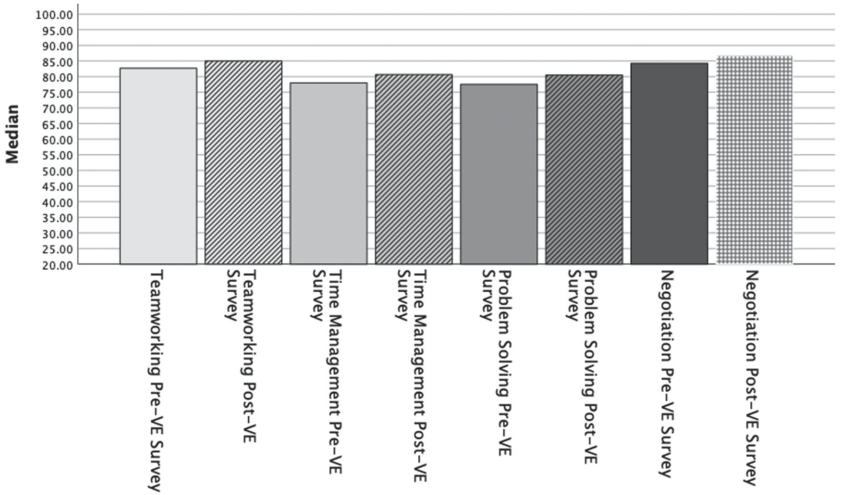

Figure 8.3: Graphical representation of the difference in pre- and post-VE transversal skills[1]

These results were consistent across three rounds of VEs supporting the replicability of the results. In addition, it is important to note that there was no improvement in any of the transversal skills in the control group. Therefore, all the perceived gain in the measured skills can be attributed to the effectiveness of the VE.

When comparing the effectiveness of the VE for the transversal skills development for student teachers and teachers separately, student teachers showed small and significant perceived improvement across all transversal skills whereas teachers showed significant improvements in three out of four skills (no improvement in teamworking skills). The largest improvement was in problem-solving skills: (student teachers: $Md_{\text{pre-VE survey}} = 75$, $Md_{\text{post-VE survey}} = 79$, $z = -4.791$, $p < 0.001$, $r = -0.3$; teachers: $Md_{\text{pre-VE survey}} = 80.5$, $Md_{\text{post-VE survey}} = 85$, $z = -4.337$, $p < 0.001$, $r = -0.32$), followed by perceived improvement in time management skills: (student teachers: $Md_{\text{pre-VE survey}} = 73.3$, $Md_{\text{post-VE survey}} = 84.5$, $z = -3.605$, $p < 0.001$,

1 *Note:* Team working skills ($z = -3.837$, $p < 0.001$, $r = -0.18$), time management ($z = -4.748$, $p > 0.001$, $r = -0.23$), problem-solving ($z = -6.434$, $p < 0.001$, $r = -0.31$), and negotiation ($z = -3.716$, $p < 0.001$, $r = -0.18$).

r = -0.23; teachers: $Md_{pre\text{-}VE\ survey}$ = 83, $Md_{post\text{-}VE\ survey}$ = 84.7, z = -2.99, $p < 0.01$, r = -0.22).

The VE type (mixed teachers with student teachers, student teachers only, and teachers only) also showed to have an effect on transversal skills development. Small significant perceived gain across all transversal skills was noted for teachers who collaborated with student teachers. Student teachers who have collaborated with other student teachers only reported small significant perceived gain in time management and problem-solving skills. Finally, teachers who have collaborated with other teachers, reported small significant improvement in all but teamworking skills. Thus, the most stable and largest perceived gain was seen in problem-solving closely followed by time management skills. The results are summarised in Table 8.4 below.

Table 8.4. Wilcoxon signed rank test results for the three types of the VEs

VE type	**Statistics**	**TW**	**TM**	**N**	**PS**
Student teachers with teachers	$Md_{Pre\text{-}VE\ survey}$	83.3	78.3	85.0	80.0
	$Md_{Post\text{-}VE\ survey}$	86.7	82.2	87.5	81.8
	z	-3.29	-3.402	-2.977	-4.222
	p	<0.001	<0.001	<0.01	<0.001
Student teachers only	$Md_{Pre\text{-}VE\ survey}$	76.2	70.8	81.8	73.3
	$Md_{Post\text{-}VE\ survey}$	76.0	76.3	81.0	78.5
	z	-1.623	-2.63	-0.558	-3.187
	p	>0.05	<0.01	>0.05	<0.001
Teachers only	$Md_{Pre\text{-}VE\ survey}$	87.3	81.0	82.5	77.5
	$Md_{Post\text{-}VE\ survey}$	86.3	84.0	89.0	82.0
	z	-1.034	-1.975	-2.787	-3.952
	p	>0.05	<0.05	<0.01	<0.001

Note: Md – Median, TW – teamworking, TM – time management, N – negotiation, PS – problem-solving

Regarding the evaluation of the impact of the VEs on the transversal skills development it is important to note that all participants scored quite high on their initial perceived levels of transversal skills and the length of the VEs was quite short.

Conclusively, in relation to RQ1, investigating the impact of the VEs on teachers' self-efficacy, the results showed that VE has a moderate significant impact on the development of self-efficacy and in particular the impact is stronger if teachers get to collaborate with student teachers. In relation to RQ2, investigating the impact of VE on teachers' and student teachers' transversal skills development, the most perceived gain was seen in time management and problem-solving skills. These skills developed the most for both student teachers and teachers and the most effective exchanges for that were VEs where teachers collaborated with student teachers.

To better understand the impact of the VE on teachers and student teacher's self-efficacy (RQ1) and transversal skills (RQ2), as well as perceived gains in professional knowledge and attitudes about teaching and online professional networks (RQ3), it is important to consider these quantitative results in light of the qualitative findings.

Main Qualitative Findings and Discussion

RQ1: Most Valued Gain in Self-efficacy

In general, the qualitative findings also demonstrate the positive impact of VALIANT VEs on the perceived self-efficacy of teachers and student teachers.

Two main themes were generated in response to RQ1. Theme 1 underscored the significant improvement in teachers' confidence and belief in their own ability to teach effectively. This included student teachers displaying confidence in their potential to become skilled educators and teachers experiencing an overall positive impact on their professional self-confidence. Theme 2 pertained to the augmented awareness among student teachers and teachers of available international support networks and digital resources, which positively impacted their beliefs regarding their capacity to overcome challenges and find effective solutions.

Themes 1 and 2 are elaborated in further detail below and substantiated by selected data quotes from the participants.

Theme 1: Enhanced confidence in the ability to teach effectively

The qualitative findings indicate that VE facilitated a collaborative environment where student teachers had the opportunity to learn from experienced professionals (i.e., teachers). More specifically, these interactions provided mentorship, guidance, and practical knowledge, which in turn boosted the student teacher's motivation and self-assurance. The following quotes illustrate the student teachers' perceptions regarding the impact of the VEs on their self-efficacy when responding to questions regarding the added value of the VE for their professional development:

> *Interacting with more experienced teachers helped me to increase my motivation and* ***self confidence*** *in my area. (student teacher)*
> *I think that the exchange and cooperation with other teachers around the world is a great added value for us students. On the one hand, because it gives us insights into the school system and, on the other hand, because we have to* ***put into practice*** *what we have studied up to that point (student teacher)*

In these quotes, the student teachers emphasised the positive impact of VE interactions and collaboration on their motivation and self-confidence. By engaging with more experienced teachers, the student teachers gained valuable insights and support, resulting in an increase in their motivation and belief in their own abilities within their specific field.

Furthermore, the student teachers' recognition of the significance of constructive feedback and advice in relation to their self-efficacy aligns with Bandura's theory that external validation and support are crucial for maintaining and enhancing one's confidence in their abilities. The following quote illustrates their perspective:

> *We gain experience, we develop our teaching strategies, materials, methods, and approaches. Getting advice from experienced teachers* ***broadened my horizon*** *for sure. (student teacher)*

Another important source of self-efficacy were the *vicarious experiences* that the student teachers underwent within the VEs. The findings suggest that the observation of role models allowed the student teachers to learn and gain confidence through observing others' behaviours and actions (e.g., when their lesson plans were implemented by the teachers). As can be seen in the following quote:

> *Yes. As a student, it was a very rewarding experience to plan a lesson with continuous feedback from experienced teachers and then see the lesson outcomes. (student teacher)*

The findings also show that participation in the VEs resulted in an enhancement of the teachers' self-confidence in their professional abilities. The results suggest that teachers experienced not only an increased sense of confidence in their teaching abilities but also a reaffirmation of their career choice. The elements contributing to the enhanced self-assurance of teachers appear to be multifaceted. These include the validation of their current knowledge and instructional approaches, the acknowledgment that fellow teachers encounter similar classroom challenges, the realisation that their students benefit from the teaching methods recommended and employed during the VE, and the gratification derived from mentoring and empowering future educators. The following quotes exemplify the diverse perspectives they expressed.

> *Perhaps I feel **more confident** as the suggestions I heard to approach situations in my context, weren't completely new for me. (teacher)*
> *I **feel more confident** about the way I teach. While talking to other teachers from different countries and sharing our examples of good practice I found out that we all struggle with similar problems and use similar strategies to solve them. (teacher)*
> *I learned a lot about CLIL methodology and how to plan a unit for my classes. The student teachers were amazing in their work and took me back 20 something years to when I was in college myself. **It helped me realize how far I have come and how much my teaching has evolved**. Also, a reminder to never stop learning! (teacher)*

Theme 2: being able to take a broader, international or intercultural perspective in the teaching and learning context

Our findings indicate that the VE experiences have expanded both the student teachers' and the teachers' awareness of the resources and support available beyond their immediate national contexts. Many student teachers realised the potential benefits of tapping into an international network for help and guidance. The following quotes illustrate this perspective:

> *Before this exchange I'd try to find solutions to my answers within a national network but now I realise that there is an international network that might be able to help me. (student teacher)*
> *It's helpful to have a network in order to reduce your own mental load. (student teacher)*

As illustrated in the quotes above, the findings indicate that the VE experiences played a role in enhancing the student teachers' self-efficacy by broadening their understanding of support networks and their own capacity to access and utilise them. Similar insights were identified among the teachers:

> *The exchange showed me that we CLIL teachers are all in the same boat and that everyone feels the same. I hope that we can start more projects, network and exchange more, to benefit from the experience and work of other teachers around the world and to learn new perspectives. (teacher)*

In terms of self-efficacy, such realisations can have a positive impact on the teachers' beliefs about their ability to find effective solutions to overcome challenges. By recognising the potential support from an international network, the teachers' collective self-efficacy was bolstered, since they developed a greater sense of confidence in their capacity to address difficulties. They could access a wider pool of knowledge, experiences, and expertise. For example, both student teachers and teachers noted an increased awareness of digital materials and online resources for lesson planning.

There was also ample evidence that VE participants wanted to continue dialogue with one another, ranging from informal WhatsApp groups to intentional collaborations to share course materials. As discussed earlier, student academic achievement is significantly higher when teachers believe in their collective abilities to influence learning outcomes. The following quotes illustrate these perspectives:

> *Yes. Exchange project is a great way of networking. I couldn't be more thankful that I am a part of this project. In my future career, I'd be looking forward to collaborations with the people I met in this programme and carry our exchange project into something much bigger in the field of ELT. As we are from different cultures and countries, this diversity will provide us with a huge following if we were to work together. I have already made plans. (student teacher)*
> *Yes, I have created some connections with teachers so that we can work on common projects in the future. We also get to use several materials created for the lessons. (teacher)*

The fact that most participants were interested in engaging in a VE in the future is an indicator of their success. In fact, expressions of gratitude, enthusiasm, and excitement are emotional indicators that align with

Bandura's concept of how emotions can impact an individual's belief in their own capabilities and contribute to the development of self-efficacy.

RQ3: Perceived Gains in Professional Knowledge, Skills, and Attitudes to Teaching and Online Professional Networks

Like self-efficacy, the qualitative analysis elaborates on how teachers and student teachers perceive teaching and online professional networks (attitudes), as well as how they perceive their growth in skills development and professional knowledge. Similar to the transversal skills development measured in the quantitative analysis, teachers also perceive positive gains in pedagogical skill development on the open-ended items included in the pre- and post- VE surveys.

First, both groups believe they gain important **knowledge in the profession**. For example, both in-service and student teachers **value practicing and learning (new) digital tools***,* stating*:*

> *Yes, the exchange has provided me with valuable information to develop both my teaching career and student activities. For instance, it has offered me* ***varied useful digital tools*** *to use in class in the future and* ***help me develop my language learning skills****. (student teacher)*
> *It is affected me by giving me* ***inspiration to use more technological tools*** *in my classroom. (teacher)*

Second, both groups believe VEs provide access to **alternative perspectives and solutions to teaching problems.** For some, these new insights were related to COVID-19-related challenges to emergency-remote teaching. For others it was insightful to learn about new tools to facilitate online learning and to consider flipped approaches as a positive option for the future regardless of the COVID-19 pandemic. For example:

> *As aforementioned, it helped me become much more aware of my role as a teacher. Furthermore, it convinced me that a mixture of online and offline methods could be highly desirable, even in a post-pandemic world. This has been quite the shift for me since I originally thought that after COVID-19 these methods would just be abandoned since they were more replacements for their face-to-face counterparts than active improvements on our teaching methods. (student teacher)*
> *I learned that we teachers have the same problems no matter our origins. I learnt about possible ways of motivating members of the school community. I learnt to use audio and video apps. (teacher)*

Importantly, student-teachers uniquely benefit from an **increased understanding of the realities of teaching *and* how to deal with them.** They could ask questions, hear anecdotes from their classroom teaching experiences and get a better sense for what their future profession is like. For example, one student teacher remarks:

> *It was great to get to know the insight of two teachers who have been of course already working a lot of years and have a lot of experience. They have **countered some myths** and **explained how things really work** in a school setting (the real world). (student-teacher)*

In addition, student teachers **increased their knowledge of teaching methodologies through feedback from "experienced peers"**. They also learned how teachers were adapting to the challenges of the COVID-19 pandemic in real-time. Since the teachers had years of experience, their perspectives were of value to the student teachers. Furthermore, they could benefit from their expertise by receiving their feedback and asking for help with the VE-associated tasks. The following quotes from two student teachers convey these perceived gains in knowledge:

> *Taking part in this Virtual Exchange **I've learnt about new tools that can be used effectively in lessons**, how teachers from different countries work during the pandemic situation, **what ways of teaching can improve pupils' skills**.*
> *Well, it definitely helped me to gain a better understanding of my future profession due to the fact that **they mentored us about possible challenges we may face** or how we can make our **training more efficient**. They also **helped us to complete our tasks** and were available whenever we had a problem or question.*

This finding also aligns with theme two from the self-efficacy qualitative analysis whereby student teachers can apply pedagogical concepts and teaching strategies as a result of mixed (teachers and student teachers) VEs. However, skill development in VEs is not exclusive to student teachers. The results show that teachers also benefit from student teachers. For example, the data suggest that teachers **learn from the alternative (students') perspective on classroom practices**. For example, one teacher states:

> ***The learning process is mutual.** I get a lot of feedback from students who are still on the other side of the learning process. Even though some of them have teaching experience. **They are still very young and have lots of ideas and practical examples***

> ***of how they would deal with the situation.*** *When I had a conundrum, I shared it with them, and* ***they offered some advice.***

Similarly, both groups perceive gains in **skill development** as a result of VEs, specifically collaborating effectively in online networks and improving digital and personal communication skills. One interesting finding that emerged is that both groups state they **improved (global) communication skills and confidence in communicating in English.** The following quotes illustrate these beliefs:

> *It's been a great experience that has made me more* ***confident about interacting with people from abroad****. (student teacher)*
> *I can say that it helps me to* ***practise in speaking skill****. I have social phobia and I get nervous when talking to a group. The project helps me to overcome it. (student teacher)*
> ***I've never thought I could participate in VE like this****, neither my students. Only two or three years ago it was an utopy. (teacher)*

Finally, both teachers and student teachers indicate positive **attitudes** toward collaborating online and value having a global support network of teachers. One student teacher explains:

> *I have learned how valuable it is to exchange with teachers from other cultures and to get to know* ***new perspectives on teaching and learning****. One is automatically encouraged to question one's own methods and points of view, to* ***reflect and to engage with unfamiliar things.***

This positive value further corroborates self-efficacy theme two whereby teachers and student teachers become more aware of international support networks. In fact, there were several statements indicating **the educational value of VEs for their own (future) pupils**.

> *Yes, it has. Before participating in this Virtual Exchange, I would never think about using Virtual Exchange programs in my future classes, but now* ***I would really love to try it*** *with my own students. (student teacher)*
> ***This VE makes me realise how important it is to interact with others and work collaboratively.*** *In this way, I would like to do something similar in my job. I am working with refugees in Spain and I think that it would be very beneficial for them to participate in a VE in order to meet other refugees in Spain, share their experiences, put into practice the Spanish language… (teacher)*

Perhaps most importantly, VE instils in studentteachers a confidence and positive attitude of talking to future peers to mitigate challenges that will arise in the future.

> *I have learnt a lot of new information that helps me feel comfortable in a digital world and it becomes more understandable discussing with partners because* ***sharing experiences with each other helps*** *to see how pupils are taught in class, if we, teachers, face the same problems and how it is possible to overcome challenges. (student teacher)*

Overall, the quantitative results show that VE participation has a positive effect on building teachers' self-efficacy (RQ1) and increasing specific transversal skills for both teachers and student teachers (RQ2). The most effective types of exchanges for developing self-efficacy were those where teachers collaborated with student teachers. The greatest improvements they reported were in their ability to collaborate with external local and international organisations to further improve their teaching skills.

Problem-solving transversal skills reflect the largest significance for both groups which corresponds with the qualitative findings (RQ2, RQ3) for both teachers and student teachers, albeit in unique ways. Where student teachers benefit from experienced peers by becoming more aware of their future profession and potential solutions to face challenges related to the realities of teaching, teachers learn from student teachers about alternative perspectives that reveal their proximity to the learning environment as recent or, in some cases, current language learners themselves. Furthermore, teachers benefit from sharing problems and challenges by feeling less isolated. Interestingly, only student teachers believe they improve teamworking skills whereas teachers do not. One potential interpretation is that student teachers perceive that by discussing problems related to their future profession, they are growing teamwork skills by problem-solving with educational experts. Teachers, on the other hand, may not perceive an increase in teamworking since they are accustomed to working with peers in schools.

According to Bandura's discussion on the sources of self-efficacy, our qualitative results, responding to RQ1, suggest that the student teachers derived significant advantages from engaging in collaborative activities because they enabled them to acquire *positive mastery experiences*, particularly when they were involved in VEs that fostered

collaboration between student teachers and teachers. This is evident in how the student teachers discussed their gains in professional knowledge, responding to RQ3. They acquired insights into teaching methodologies and classroom practices by actively engaging in the teaching process, designing lesson plans, receiving feedback from experienced educators, and observing the positive impact of their ideas when implemented by teachers. In this regard, these VEs contained core features of an internship, providing student teachers with access to the reality of the teaching profession which represented a valuable, practice-oriented learning opportunity for them.

The findings suggest that these *vicarious experiences,* even when they involved failures, played a crucial role in shaping the student teachers' self-confidence and preparedness for the challenges they would face as teachers. Furthermore, the chance to receive *constructive feedback* and guidance on their projects and teaching-related challenges during the VEs encouraged self-reflection and motivated the student teachers to persevere in their pursuits.

It is intriguing that a subset of the participating teachers experienced a sense of relief upon realising that teachers from various countries share similar experiences, especially when it comes to encountering difficulties in teaching. The findings indicate that this realisation played a crucial role in helping these teachers understand that they are not alone in facing these difficulties. Consequently, their knowledge of the reality of teaching shared by the experiences of "expert peers" increased their confidence in their ability to overcome these challenges and elevated their perceived level of self-efficacy.

Finally, it is evident that a considerable number of teachers value the opportunity to temporarily assume the role of mentors for motivated students revealing a perceived favourable attitude toward online professional networks (RQ3). This experience prompted them to engage in introspection regarding their own level of knowledge and practical skills acquired throughout their careers, as well as the noticeable knowledge gap between them and the student teachers. Within Bandura's conceptual framework, this accurate self-reflection pertaining to one's competence emerges as a crucial factor in accurately assessing one's abilities and determining an appropriate level of self-efficacy (RQ1). It is possible that amidst the demanding nature of teachers' daily lives, these moments of success may be overshadowed and relatively fleeting, thereby potentially failing to

provide sufficient grounds for effectively calibrating one's belief in their own capabilities.

Conclusion

Our findings have shown that in such challenging times (such as the COVID-19 pandemic), initiatives like the VALIANT program can provide a platform for teachers to share their knowledge and learn from collective mistakes and successes. Quantitative and qualitative analyses show that frequent interaction with peers establishes healthy community expectations and bolsters what teachers believe they know and can do in their educational practice. Furthermore, online collaboration is a place where teachers practise critical skills for the workforce as well as for their own teaching practice. Teachers value online collaboration and participating in an international teaching community. This is important because when teachers become more aware that their struggles are shared globally and not the result of a personal failure, their self-efficacy increases. Studies have shown (e.g., Ortan et al., 2021) that teacher turnover rates often result from factors like attrition, burnout, and emotional exhaustion. Our findings suggest VE can mitigate these issues while simultaneously building perceived gains in knowledge about the profession and develop skills for innovative educational practices. Finally, networking opportunities in a less formal setting allows both student-teachers and teachers to share their expertise and perspectives thereby fostering the transition of individual self-efficacy beliefs into collective ones.

References

Angelini, M. L., & Muñiz, R. (2021). La simulación a través de intercambios virtuales en la formación de profesorado. *Edutec. Revista Electrónica De Tecnología Educativa*, (75), 65–89. https://doi.org/10.21556/edutec.2021.75.1913

Assessment of Transversal Skills. (2020). Retrieved July 10, 2023: http://www.ats2020.eu/#

Bach, A. (2022). Selbstwirksamkeit im Lehrberuf: Entstehung und Veränderung sowie Effekte auf Gesundheit und Unterricht (Pädagogische Psychologie und Entwicklungspsychologie 101) (1st ed.). Detlef H. Rost. https://doi.org/10.31244/9783830995166

Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (Vol. 5, pp. 307–337). Information Age Publishing.

Bragg, L. A., Walsh, C., & Heyeres, M. (2021). Successful design and delivery of online professional development for teachers: A systematic review of the literature. *Computers & Education*, *166*, N.PAG. https://doi.org/10.1016/j.compedu.2021.104158

Braun, V., & Clarke, V. (2022). *Thematic analysis. A practical guide*. SAGE.

Cinque, M. (2016). Lost in translation. Soft skills development in European countries. *Tuning Journal for Higher Education*, 3(2), 389–427. https://doi.org/10.18543/tjhe-3(2)-2016pp389-427

Dietrich, S. E. (2022). Unexpected affordances of Virtual Exchange as teacher education: learning about, with, and from students in a conflict country. *Journal of Virtual Exchange*, *5*(SI-IVEC2021), 24–41. https://doi.org/10.21827/jve.5.38345

Donohoo, J. A. M. (2016). Collective efficacy: How educators' beliefs impact student learning: How educators' beliefs impact student learning (1st ed.). Corwin.

Goddard, R. D., Hoy, W. K., & Hoy, A. W. (2000). Collective teacher efficacy: Its meaning, measure, and impact on student achievement. *American Educational Research Journal*, *37*(2), 479–507. https://doi.org/10.3102/00028312037002479

Kennedy, M. M. (2016). How does professional development improve teaching? *Review of Educational Research*, *86*(4), 945–980. https://doi.org/10.3102/0034654315626800

Künsting, J., Neuber, V., & Lipowsky, F. (2016). Teacher self-efficacy as a long-term predictor of instructional quality in the classroom. *European Journal of Psychology of Education*, *31*(3), 299–322. https://doi.org/10.1007/s10212-015-0272-7

Mourshed, M., Patel, J., & Suder, K. (2014). Education to employment: Getting Europe's youth into work. McKinsey & Company.

O'Dowd, R., & Dooly, M. (2022). Exploring teachers' professional development through participation in Virtual Exchange. *ReCALL, 34*(1), 21–36. https://doi.org/10.1017/S0958344021000215

Ortan, F., Simut, C., & Simut, R. (2021). Self-Efficacy, job satisfaction and teacher well-being in the K-12 educational system. *International Journal of Environmental Research and Public Health*, *18*(23), 12763. https://doi.org/10.3390/ijerph182312763

Skaalvik, E. M., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of relations. *Teacher and Teaching Education*, *26*, 1059–1069.

Jekaterina Rogaten

9. Case studies: Virtual Exchange – How and why it works

Introduction

This section of the volume presents a collection of explanatory case studies that looks at the three distinct types of Virtual Exchanges (VEs) for student teachers' education and teachers' professional development. In the first case study, we will describe a VE that was set up specifically for the teachers where they collaborated with other teachers from different countries. In the second case study, we will present a VE that was set up for teachers and student teachers to work together. Finally, in the third case study we will describe the VE that was set up for collaboration between two classes of student teachers (students of teacher education). The descriptions of each VE type are provided in Chap. 2.

The aim of these case studies is to provide an outline of the design and delivery for each VE type. The results of the quantitative and qualitative analysis will provide an in-depth understanding of how participation in each VE type contributed to the personal and professional development of participants. The focus of the analysis will be on the impact of VE on teachers' and student teachers' levels of motivation and isolation as well as digital skills, transversal skills (i.e., teamworking, time management, problem-solving, and negotiation) and intercultural communication (i.e., collaboration, behaviour, perspective taking and learning). Importantly, the analysis of qualitative data will demonstrate other important learning gains that are distinct for each of the VE types.

In addition, each case study provides recommendations for other practitioners who would like to organise and run similar VEs. The recommendations are based on the results of data analysis and on VE coordinators' personal reflections. This chapter thus provides necessary information on why and how to engage in VEs as a form of teaching and what should be considered in the development and delivery of VEs.

Case study 1: Virtual Exchange for teacher to teacher collaboration

Margarida Morgado, Laura Torres Zuniga & Jekaterina Rogaten

Acknowledgement: We extend our heartfelt appreciation to Paulo Afonso, António Pais, and Helena Mesquita for their invaluable support, without which this VE project would not have been possible. Their contributions, alongside the two first authors of this chapter, have helped create a meaningful and enriching learning experience for all participants. We are truly grateful for their assistance and dedication.

Context

The VE, *Diversity and Inclusion in Our Classrooms*, was designed to assist teachers with integrating all students into courses, irrespective of socioeconomic status, linguistic or educational backgrounds, and achievement levels. Taking place between October and November 2022, this VE fostered collaboration among teachers from various European and neighbouring countries. The VE was organised by Polytechnic University of Castelo Branco, Portugal and Universidad Autónoma de Madrid, Spain.

Over a span of 7 weeks, participants engaged in a 17-hour co-learning experience, addressing concrete classroom challenges pertaining to diversity and inclusion. The exchange embraced both synchronous and asynchronous components, utilising platforms like Zoom for real-time collaboration and preferred tools such as messaging apps and emails for flexible engagement. A variety of digital resources, including the VALIANT Moodle platform, as well as applications like Padlet, Mentimeter, and Tricider, were leveraged to facilitate content publication and encourage co-learning.

Throughout the exchange, the focus was on sharing experiences, thoughts, beliefs, and perspectives, while fostering team building,

co-learning, and collaboration in the online environment. The VE served as a catalyst for participants to acquire essential skills and competences vital for active involvement in collaborative online projects. Furthermore, it established a supportive community that persists beyond the formal VE, allowing for continued co-learning among its members after the formal VE had ended. It thus had a content focus, involved active learning in line with teacher practice and required collective participation (Desimone, 2021).

Participants

A total of 15 participants took part in the VE, representing a diverse range of countries. Among them, 6 participants were from Spain, 4 from Portugal, 3 from Turkey, and 2 from Germany. Most of the participants were females (n=13). Participation in the research was voluntary, and 7 teachers completed pre-VE survey, post-VE survey, and mid-VE qualitative survey. Additionally, 3 of the participants took part in in-depth interviews conducted by the VE coordinators. Although the sample size was small, the insights gained from the experiences of teachers collaborating with their peers offer valuable perspectives. These insights shed light on the intentional and additional learning acquired through their participation in the VE.

How the Virtual Exchange Was Run

The VE was facilitated by two coordinators, one from Spain and one from Portugal, who played pivotal roles in guiding and supporting participants. Their responsibilities included providing *just-in-time* help, coaching, individual and group support, directing participants to relevant resources, and fostering self-reflection and meta-reflection on co-learning, diversity and inclusion, as well as intercultural exchanges. It is important to note that this case study pertains to the second iteration of the VE.

In designing the VE, a task-based methodology was adopted, utilising O'Dowd and Ware's (2009) Progressive Exchange Model for international collaboration online. The VE consisted of several types of tasks that participants had to complete. The initial activity aimed to facilitate introductions and enable participants to get to know each other. Subsequent tasks focused on exchanging information regarding inclusion and diversity issues in the teachers' respective contexts. Following this, participants were invited to compare and analyse diversity and inclusion solutions, as well as educational guidelines, specific to each participant's context. Finally, participants were required to create (together with their study group) a multimodal presentation lasting 3–5 minutes, offering recommendations and advice to assist other teachers in addressing similar challenges. These tasks were organised into three stages, fostering collaboration among teachers within online virtual teams.

In addition, to extend teachers' collaboration and co-learning beyond the completion of the VE, participants were encouraged to identify other topics of interest. Eleven new topics for collaboration were proposed, and the 5 most popular topics were selected to form new collaborative groups. This facilitated continued teamwork and learning among participants after the VE concluded. The weekly tasks are described below.

Week 1 (synchronous session 90 minutes): Prior to the session, participants were invited to get to know fellow teachers by sharing personal experiences and interests on the course topic (diversity and inclusion) through a voice/video introduction on the class Padlet. During the synchronous session participants elected the diversity and inclusion topics they would like to work on together (e.g., "Teaching culturally and linguistically diverse students", "Teaching mixed level classes", and "Motivating hard-to-reach students") and with the help of course facilitators, multinational working groups were assembled on the whiteboard app Jamboard. The groups started collaborating in order to further investigate the chosen topic through a Fact File (a short report of all the most important information on the topic a team can assemble from their experience and expertise).

Week 2 (synchronous session 90 minutes): The first task focused on team building by highlighting and distributing possible roles within each group based on likings and strengths. Participants worked in their groups to complete the Fact File they had initiated in the previous week. In between synchronous sessions, research papers were shared by course

facilitators to invite further readings on the topic of diversity and inclusion in schools.

Week 3 (synchronous session 90 minutes): Working groups presented Fact Files to other working groups and reflected on the best communication tools to impart the facts they had assembled. They were invited to watch some multimodal presentations on topics of diversity and inclusion as models for further work.

Weeks 4–5 (synchronous and asynchronous work): In their working groups, participants arranged to meet together to prepare a multimodal presentation on their topic directed at other teachers. In the Moodle platform guidelines were offered on the steps needed to complete the presentation. Towards the end of week 5, all groups were invited to share their multimodal presentations and post comments on other groups' presentations in the Moodle forum.

Week 6 (synchronous session 90 minutes): Participants were invited to share their experiences and feelings about their collaborative co-learning experience on Padlet and explore its advantages and disadvantages on Tricider. At the end of the session, participants suggested topics for further co-learning and reassembled in different working or interest groups. The three new collaborations were formed to co-work on the following themes: "Techniques to encourage students to participate in class without stress"; "Simple tasks to avoid stereotypical behaviours" and "Motivating students to continue to learn English outside the classroom".

Week 7 (synchronous session 90 minutes): In the last session, the new working groups were invited to plan and share how they will continue to co-learn by creating an announcement for other teachers (outside the network) to join them and make decisions on resources and timeline. The main goal was for teachers from the VE to share what they had learned, apply it to new contexts and experiment with running a VE.

Learning Outcomes

To assess the effectiveness of the VE, descriptive statistics were calculated for each of the study variables that were measured using pre-VE and

post-VE surveys. The qualitative data from the mid-VE qualitative surveys and interviews were analysed using Thematic Analysis (Nowell et al., 2017). For the details of data collection timeframe, tools, and data analysis see *the Research methodology of the VALIANT study* (Chap. 3 in this volume). The interviews were done via Zoom and were audio recorded. The initial transcription was done using Zoom's integrated transcription tool. The VE coordinators edited and finalised transcripts prior to the analysis.

From a *quantitative* perspective the largest self-reported change was noted for the intercultural competences i.e., behaviour and collaboration. The next largest improvement was reported in digital competences and self-efficacy followed by transversal skills i.e., problem-solving and negotiation. The improvement in digital competences, transversal skills, and intercultural competences as well as self-efficacy are presented in Figure 9.1, 9.2 and 9.3, and all were as expected.

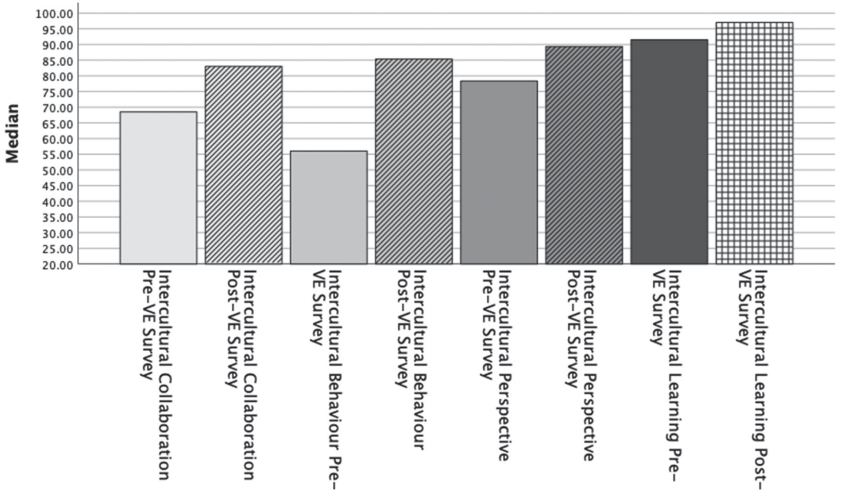

Figure 9.1: Intercultural competences median for the pre- and post-VE surveys

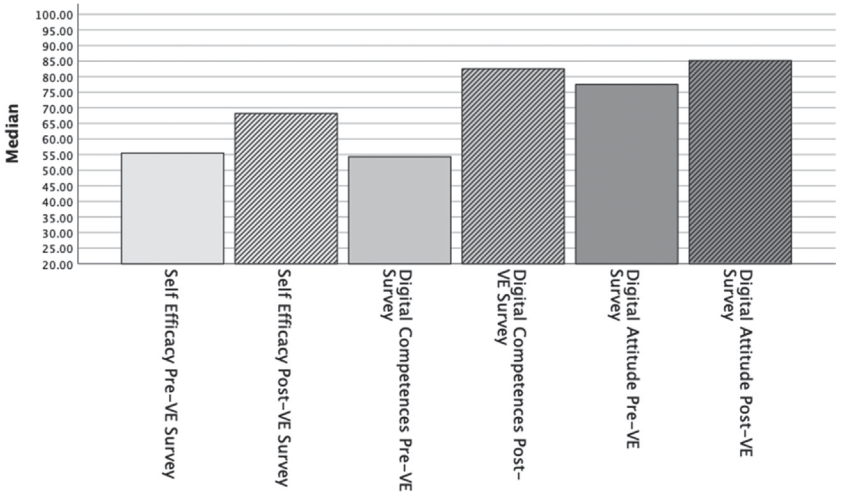

Figure 9.2: Self-efficacy and digital competences median for the pre- and post-VE surveys

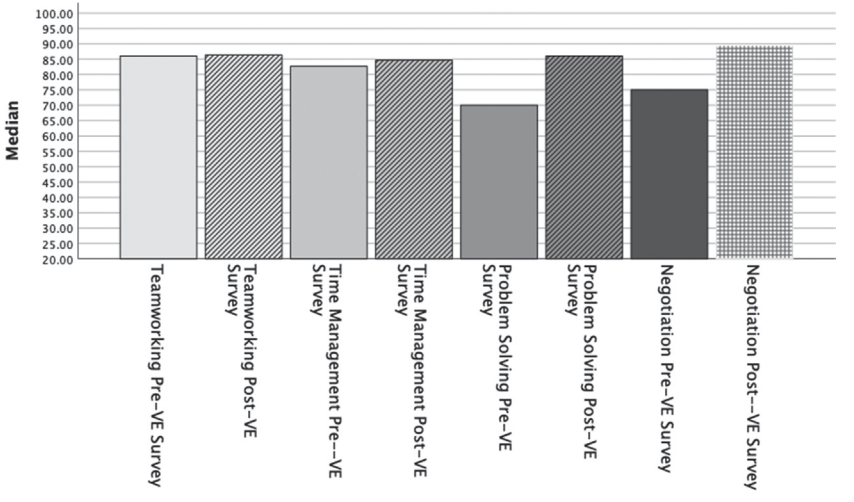

Figure 9.3: Transversal skills median for the pre- and post-VE surveys

There was largely no change in the levels of motivation and a subtle increase in self-reported levels of isolation at work. The increase in

perceived feeling of isolation at work could be due to the surveys used in this study to assess isolation. Isolation was measured in the workplace and it is reasonable to assume that participants did not perceive their participation in the VE as part of their formal workplace environment. However, overall results are largely in line with the hypothesised increase in self-efficacy, transversal skills, digital skills and intercultural competences, indicating the generally positive impact of VE on participants' professional development.

It is important however to acknowledge that the quantitative analysis for this VE was based on a very small sample and results therefore present a limited overview of the VE impact on professional development. To better understand the effect of this VE and gain an in-depth understanding of teachers' experiences, survey data and interview responses were analysed.

Overall, the analysis revealed that teachers felt that the lockdown during the COVID-19 pandemic and changes to the work routine thereafter had impacted their working conditions. From the *qualitative* data analysis, three main themes emerged that are reflecting this change: (a) advantages of international collaboration: learning and networking, (b) difficulties and opportunities of online interaction and group work, and (c) the VE as a valued type of professional development.

The main change was in the way teachers collaborated, switching from face-to-face to online collaborations. They felt isolated and separated from colleagues and students and were quite sensitive to any other situation during the VE that might aggravate their feelings of isolation such as not being able to participate fully in online group discussions or their colleagues missing online group appointments. They perceived this increase in online collaborations to result in a loss of teaching and learning efficacy. However, at the same time, teachers reported the positive effect the VE participation had on them. VE online collaboration expanded their opportunities for international collaboration, taught them to overcome difficulties and see the benefits of online interaction and group work. In addition, teachers saw VE collaborations as means for professional development.

Advantages of International Collaboration: Learning and Networking

International collaboration was mentioned by most participants as valuable learning. Teachers valued how international collaboration enhances

an intercultural perspective on their own teaching. The VE as an online network for teachers to share practices, concerns and co-learning can yield some realisations of intercultural awareness:

> Culturally, for example, I discovered in this exchange that Turkey is not so different from Portugal. I thought that we would be much more different than we are. I discovered that there are others just like me in different countries.
> I just have made a self- reflection, and I was aware that I was not so competent to share my own cultural elements. It was a good self- reflection for me: I had difficulties about it, but not because of the task itself, […] I was aware of the fact that I have to be more aware of my cultural routines and to express them in English.

The VE's international collaboration also opens up possibilities for teachers to learn from one another about new teaching methods and strategies, or gain access to materials and practices that aid them in solving concrete problems (such as avoiding stereotypical behaviours in the classroom). In the views of participants, this type of online shared learning is deemed particularly valuable because it creates opportunities for teachers to develop intercultural communicative competences.

> […] language skills, language expression skills, and self-expression skills as well as turn-taking and dealing with cultural ambiguity.

Furthermore, international collaboration through this particular VE was perceived by some respondents as diminishing their feelings of isolation. Participants claimed they gained a sense of being part of a larger community of teachers with similar problems and concerns, despite their (sometimes radically) different national and teaching contexts. In this *ad hoc* Community of Practice (e.g., Karavas & Papadopoulou, 2014), they felt at ease to share concerns and co-work to find the most appropriate solutions for their own teaching environments.

Difficulties and Opportunities of Online Interaction and Group Work

Language is at the heart of international communication. In this VE that brought together English teachers and primary teachers who do not specialise in English teaching or only partially so, the use of English as a lingua franca (ELF) was considered an asset for some participants as they

valued their own developing ability to share meanings effectively across cultural barriers.

While this ELF awareness is a necessary and helpful perspective in the training of English teachers (Sifakis, 2018), one of its challenges was the codeswitching of some participants to their shared mother tongues during group work when searching for the most appropriate term or turn of phrase. This was perceived as annoying and not particularly conducive to effective group work as it isolated non-speakers of that language and pushed them to the side of the team.

> I feel isolated and sometimes to be honest bored when they talk, you know, in their L1 and their preference or their tendency to use their L1 rather than simple English. Let's say, it may sometimes demotivate me during the group discussions, […].

However, in line with the positive valuation of international collaboration, online group work served as a model for teachers to engage their own school students in international collaborative VEs for improving their English skills. The VE also increased teachers' motivation to contact teachers internationally and was seen by some as an opportunity for student teachers to use English outside the classroom and not feel isolated.

> So I think this Virtual Exchange program, or a Virtual Exchange program with a group of students, […] may meet their (English language learning) expectations, or may decrease their feeling of isolation.

The difficulties of group work were also mentioned. Participants acknowledged several challenges that online group work presented. Among the challenges were team building, differing digital competences and online access among the group members, besides time constraints due to personal and professional reasons.

Online teambuilding seemed to be particularly hard due to the lack of commitment of some group members who failed to join their group meetings, attend the VE, or meet deadlines. A second level of difficulties concerned group operations. However, the leadership model followed in this VE i.e., "distributed leadership, in which the duties of the leader are shared among several members within the group […] based on their specific skill sets" (Luo et al., 2022, p. 2), seemed to constitute good advice for online teambuilding, as is assigning one group member the role to *"*clarify ambiguities and misunderstandings". This would contribute to creating a safe

psychological atmosphere for equal communication (Zárraga & Bonache, 2005). However, as pointed out by Ortega et al. (2010) group leaders require coaching before, during and after leadership processes.

A further aspect that affected the smooth running of online group work concerned the different levels of digital abilities and competences of group members. Interviewees described several mitigating strategies for this diversity of digital competences: for example, coaching weaker team members individually, distributing tasks according to digital ability, or allowing less competent members more time to finish tasks.

The VE as a Valued Type of Professional Development

The perceived value of the VE emerged as a strong theme in qualitative surveys and interviews. It concerns the content of the VE, methodology, as well as the competences developed.

Many interviewees linked the quality of online interaction during the VE to the international composition of the working groups (the more members of different nationalities present, the richer), the depth of discussion of issues connected to diversity and inclusion, as well as engagement in team discussions and tasks.

It was obvious that participants wished to go beyond the mere exchange of ideas into cooperative meaningful work that could solve concrete problems in their classrooms. A combination of research articles with shared classroom practices was highlighted as adequate content, with participants particularly valuing the task-based approach and the final products they had co-created, as well as feeling validated in their own thoughts about the topic:

> It is very encouraging to see that there are more people who think that this is the right way to teach diversity, prioritising inclusion of course.

Suggestions about improvements to the VE included incorporating more multimedia materials on concrete classroom experiences and inviting other stakeholders in the field of inclusive education, such as parents, school managers, and student teachers to discuss concrete topics.

Methodologically, there were very positive comments on the role of the VE facilitators as guides on the side who stimulate interaction through

techniques and strategies that facilitated teambuilding and group interaction, and who enhanced the collaborative work within each group towards the development of a final product.

As shown in the quantitative data, the gain in digital competences was also apparent in the qualitative surveys and interviews. Participants valued learning about building digital content online collaboratively, learning about new apps and tools for pedagogical purposes, as well as online collaborative tools.

> We also share some resources and digital tools that we find, and it's nice to do that because we can share things that we like and then we can use them in our classes.

> It was really fun to do our work on Canva. We kept discovering new things and nicer things to put in our work. It was great that we could all be working on it at the same time in such different places!

> Through my group colleagues I learned about Genial.ly, as we don't use it that often in Germany. I think it's a great tool!

On the whole, participants' realisation of their own skills increased their self-efficacy and confidence as teachers and also their willingness to enhance student teachers' experience in a similar way. Respondents valued the feedback they received from other participants on their own strengths and expertise.

Summary and Recommendations for other Practitioners

This VE involved collaboration between teachers. Overall, the results of quantitative and qualitative data analysis showed similar findings, particularly in what concerns the development of intercultural competences, problem-solving, teamworking, self-efficacy, and digital competences. It is important to acknowledge that due to the diversity in initial digital competences of the participants, the development was hindered for the more competent technology users. However, overwhelmingly, teachers acknowledged the benefits of VE for their confidence in using digital tools in learning (de Jong, 2012), their self-efficacy as a teacher and their ability to practise the English language.

All teachers acknowledged that the most important benefit of the VE was learning about teachers' work and school cultures in other countries. The VE allowed teachers from different countries, cultures and education systems to learn from each other and realise that despite some perceived systemic differences, all teachers face largely similar challenges in their work. The teachers' experiences of collaboration and sharing their professional stories made them realise that they had more in common than they previously thought. In their qualitative surveys and interviews, all teachers emphasised the profound advantage of belonging to a teaching community that transcends physical boundaries. They expressed gratitude for being part of a larger community that enables them to learn, enhance their teaching skills and strategies, and, above all, receive invaluable social support and understanding regarding the challenges they encounter in the classroom.

This building of community is an interesting point to make when promoting VEs as a type of professional development for teachers who feel isolated in their profession (not necessarily in the work environment) and would benefit from a community of teachers where they can discuss solutions to problems they encounter in their work. These results are in line with Vadivel et al., (2021) for teacher continuous professional development, as they highlight shared experience, reflexivity and the building of a sense of community. In addition, "learning by doing" can be advertised as a valued feature of VEs, since teachers will be quick to transfer the model into their own classroom practices.

From the analysis of qualitative data and the coordinators' reflection, there are several improvements that can be made in the future. An interesting aspect teachers highlighted was the immediate applicability of what they learned and co-produced in the VE to their own school contexts. In developing their topics – "Teaching culturally and linguistically diverse students", "Teaching mixed level classes", and "Motivating hard-to-reach students" – they were able to de-centre perspectives, find commonalities and apply others' solutions to their own local contexts by trial and experimentation. As an improvement to this type of VEs, we would advise extending the duration of the VE or postponing the last sessions so that participants have enough time and opportunities to put into practice in their classrooms the solutions, activities, or techniques they have come up with together, and then share their experience back in the VE with their colleagues.

The other important suggestion for improvement is to homogenise the digital competences of participants to enhance collaboration quality. Not all teachers have the same levels of digital competences or experience, but by sharing apps and digital solutions to collaborate on a project they were able to increase their confidence in using technology for teaching and online collaborative work in their classes. Thus, allowing some time for this sharing of digital experience within groups before they start to use the tools collaboratively would help prevent the unbalances and facilitate collaboration.

In order to create a meaningful virtual experience, it is crucial to foster strong teamwork and promote effective online interaction among participants (Vinagre, 2017). The collaborative efforts of VE workgroup members, along with teambuilding and cohesion, play a pivotal role in addressing challenges such as absences, aligning participants' nationalities for team building, organising tasks, and achieving success in VEs. As Hahn (2020) affirms, "personal introductions play a crucial role because they form the grounds for establishing social contacts in the group. A good atmosphere and strong group cohesion are central in these projects" (p. 24). Thus, as part of the planning process, we recommend incorporating online activities that facilitate ice-breaking and enable group members to openly discuss their strengths and weaknesses before assigning specific roles within the virtual groups. Furthermore, it is essential to establish a sense of commitment among participants at the outset of the VE, emphasising their dedication to working together at designated times on specific days of the week, regardless of whether the sessions are synchronous or asynchronous. This reinforcement ensures that all group members remain dedicated to their responsibilities throughout the duration of the VE.

It is important to stress that coordinators of the VE play a pivotal role in organising and managing VE (Gutiérrez et al., 2021; Helm, 2016; O'Dowd et al., 2020), making sure the content is available to all participants. We strongly recommend encouraging autonomy in collaborations and ensuring the adaptation of the VE to each participant's circumstances and contexts.

In summary, teachers were highly satisfied with their experience in this *Diversity and Inclusion in Our Classroom* VE. The post-VE satisfaction survey revealed that all participants would enthusiastically recommend the VE to both in-service and student teachers. Moreover, the collaborative development of inclusion and diversity topics by teachers resulted in

readily accessible resources that can be utilised by all participants in their respective classrooms. The VE experience also motivated teachers to organise VEs for their students so that students could benefit from developing intercultural communication competences and digital collaboration skills.

Case study 2: Virtual Exchange for teacher and student collaboration

Shannon Sauro, Anna Wärnsby & Jekaterina Rogaten

Special acknowledgement: We would like to express our gratitude to Ingrid Hortin and Sirkka Ivakko, the teachers at MAU, for their support in running this VE. We also extend our thanks to Sarah Clement, the graduate assistant, for her diligent transcription work. Their contributions have made a valuable impact. Thank you.

Context

Similar to case study 1, *Diversity and Inclusion in Our Classroom* was also a theme for the VE described in this study. However, unlike the previous case study, this VE invited teachers to consult with student teachers and to share the experiences and challenges that they were facing regarding diversity and inclusion in their classrooms. This VE also brought together a range of different types of students with various backgrounds and levels of prior teaching experience. It was also designed to overcome some of the challenges encountered when VE is carried out among participants in different time zones and with vastly different work schedules.

This VE was integrated in the two partner classes, one in-person undergraduate course at Malmö University (MAU) in Sweden, and one blended-learning graduate course (80 % of class meetings were held online and 20 % in person) at the University of Maryland, Baltimore County (UMBC) in the United States (US). In addition, teachers, from

Slovenia and Germany, served as expert consultants. This VE was conducted in English over a 7-week period between February and April 2022 and employed both synchronous and asynchronous components to manage the 6-hour time difference between the classes and the full-time work schedules of the UMBC students.

During weeks 2–5 of the VE, whole group Zoom meetings were held to bring the teachers and available student teachers together (after the workday in Sweden and at lunch time in the US). These Zoom sessions were recorded for those who were unable to attend. In addition, the student teachers were organised into international working groups and collaborated synchronously or asynchronously on a sequence of tasks. Along with Zoom, Padlet and the VALIANT Moodle platform were used by all participants. The student teacher groups also used additional technologies for collaboration (e.g., WhatsApp, GoogleDocs, Box, Messenger, Email, WebEx).

Participants

Initially, the VE was completed by 5 teachers and 22 student teachers from the two universities. Participation in the VALIANT research strand was voluntary, resulting in a total of 18 participants who completed the pre-, mid-, and post-VE surveys, upon which this case study is based. Among the participants were 3 teachers (2 from Slovenia and 1 from Germany) and 15 student teachers (8 from MAU and 7 from UMBC).

The student teachers from both partner universities were training to become teachers of English as a foreign or second language. The MAU class consisted of undergraduate students in the third year of a four-year program, all training to be teachers of English at the primary school level in Sweden. Their prior teaching experience was limited to the teaching practicum courses they had completed at that point (approximately 10 weeks). The UMBC class was a master's level course for students training to be teachers of English as either a foreign or second language across various age levels (primary and secondary) in the state of Maryland or primary, secondary, and adult levels in different countries (e.g., the US,

Bolivia). This class included students with a wide range of prior or current teaching experience including those with 10+ years teaching English to adults or secondary school students, those currently teaching other languages (e.g., French), and those with no prior teaching experience. In addition to domestic US students, the class also included international students from Argentina, Bolivia, Egypt, and Iran who had recently come to the US to complete their graduate studies.

How the Virtual Exchange Was Run

This VE had three facilitators (two from Sweden and one from the United States). The main role of the facilitators was to engage in pedagogical mentoring (O'Dowd et al., 2020) with their respective students during class meetings to help them reflect upon and learn from the challenges and critical incidents that arose during the VE. In addition, the facilitators organised Zoom meetings among the teachers and hosted and moderated the whole group Zoom activities and panel discussions that brought the student teachers and teachers together.

International working groups of student teachers were formed (3–4 MAU students with 2 UMBC students) to enable them to collaborate on weekly tasks. The teachers were organised into their own separate group to help them discuss and plan for their panel discussions.

The VE consisted of a sequence of six parallel tasks. One set of tasks was created specifically for student teachers and was modelled on those described in the section on case study 1 in this chapter. Another set of tasks was developed for the teachers (summarised in Table 9.1). Accordingly, the teachers were in collaboration with other teachers, while student teachers were in collaboration with other student teachers. Teachers and student teachers were brought together during 4 whole group Zoom sessions. In these sessions, the teachers could share their expertise with student teachers through panel discussion or responses to questions. This structure was devised to address the time zone and work schedule issues and had an emphasis on horizontal learning (learning from and in collaboration with peers) with minimal vertical learning or interaction between the in-service

and student teachers. At best 2–3 questions were raised by the student teachers during the panel discussions, which meant most student teachers did not directly interact with the teachers during the VE.

Table 9.1. Timeline of tasks and whole-group Zoom sessions

Week 1	
Task 1 All participants in the VE create a short video introduction which they post to Padlet and share contact information, identify challenges related to diversity and inclusion relevant to them, and begin planning for the coming weeks.	
Week 2	
Student teachers *Task 2* Student working groups develop a fact file about an issue or challenge related to diversity and inclusion that was identified in their video introductions.	*Teachers* *Task 2* Teachers brainstorm ideas and themes related to issues and learning needs related to diversity and social inclusion based on their experience and develop discussion questions.
Zoom Session 1 Introductions and breakout activities on terms for diversity and inclusion in different countries.	
Week 3	
Student teachers *Task 3* Student working groups develop a plan for a multimodal presentation based on their fact file.	*Teachers* *Task 3* Teachers prepare questions and answers for their first panel discussion in response to questions generated during Task 2 and by students.
Zoom Session 2 First teacher panel on experiences and challenges faced in response to diversity and inclusion in their contexts. Response to student questions.	
Week 4	
Student teachers *Task 4* Student working groups develop a script and storyboard for their multimodal presentation.	*Teachers* *Task 4* Teachers prepare questions and answers for their second panel discussion in response to questions generated during Task 2 by students.

Table 9.1. Continued

Zoom Session 3 Second teacher panel on experiences and challenges faced in response to diversity and inclusion in their contexts. Response to student questions.	
Week 5	
Student teachers *Task 5* Student working groups finalise and share their multimodal presentation.	*Teachers* *Task 5* Teachers provide working groups feedback on their multimodal presentation drafts.
Zoom Session 4 Students share drafts of multimodal presentations in breakout groups with teachers for feedback.	
*Weeks 6 & 7**	
Task 6 All participants watch the multimodal presentations and reflect on what they have learned during this VE in a Moodle discussion forum.	

Learning Outcomes

The results reported here are based on the pre-, mid- and post-VE surveys, and the interviews carried out with 2 of the teachers (1 from Slovenia and 1 from Germany). The interviews were done using the VALIANT interview protocol for teachers (see Chap. 3 for details).

To assess the effectiveness of the VE, descriptive statistics were calculated for each of the study variables that were measured using pre- and post-VE surveys. For the details of data collection see *the Research methodology of the VALIANT study* (Chap. 3). Due to the small sample, inferential statistics tests were not feasible to run as they would be unlikely to produce accurate results. Therefore, descriptive statistics were used to see if the results were going in the predicted direction i.e., perceived increase

in self-efficacy, motivation levels, digital and intercultural competences, transversal skills, and a decrease in feelings of isolation.

The data from the mid-VE surveys and interviews were analysed qualitatively by the first two authors. Interviews were conducted in English by the first author of this case study. The interviews were done via Zoom and were audio recorded. The initial transcription was done using the transcription software Grain. This initial transcript was then edited and finalised by a graduate assistant researcher.

The results foreground what was learned from this experience and could serve as guidelines for other similar VEs. Thus, learning outcomes as measured on pre- and post-surveys are one component in a predominantly qualitative study (see Dörnyei, 2007 for a discussion of different mixed methods approaches) that emphasised themes which emerged from qualitative open questions and interviews.

In relation to the *quantitative* analysis of the surveys, the largest gain for all participants was reported in digital competences ($Md_{pre\text{-}VE\ survey}$ = 64.5; $Md_{post\text{-}VE\ survey}$ = 96.7) followed by intercultural behaviour ($Md_{pre\text{-}VE\ survey}$ = 74.5; $Md_{post\text{-}VE\ survey}$ = 90.2), time management ($Md_{pre\text{-}VE\ survey}$ = 74.2; $Md_{post\text{-}VE\ survey}$ = 85.7) and teamworking skills ($Md_{pre\text{-}VE\ survey}$ = 80.5; $Md_{post\text{-}VE\ survey}$ = 90.7) . Teachers also reported an increase in their self-efficacy ($Md_{pre\text{-}VE\ survey}$ = 51.7; $Md_{post\text{-}VE\ survey}$ = 68.6).

There were some notable differences between teachers and student teachers. Namely the difference was noted in teachers reporting twice as high increase in digital competences than students, whereas student teachers reported fourfold increase in intercultural behaviour. Teachers also reported perceived increase in external regulation[1] ($Md_{pre\text{-}VE\ survey}$ =17.5; $Md_{post\text{-}VE\ survey}$ = 46.5), and also intrinsic motivation ($Md_{pre\text{-}VE\ survey}$ = 77.3; $Md_{post\text{-}VE\ survey}$ = 87), whereas student teachers reported no change in external regulation and a decrease in intrinsic motivation ($Md_{pre\text{-}VE\ survey}$ = 88.3; $Md_{post\text{-}VE\ survey}$ = 79).

The differences reported between the teachers and student teachers are most likely related to the two elements of the VE that were different for these two groups: the nature of the tasks they completed, and who they

1 External regulation – is the least autonomous form of extrinsic motivation. It is characterised by behaviour that is driven by external rewards (tangible or not) or the satisfaction of certain demands.

interacted with in the VE. First, the tasks carried out by the teachers (preparing for panel discussions) required minimal collaboration and more discussion and sharing. In contrast, the main tasks for the student teachers (i.e., the development of a fact file and video presentation) required a higher degree of collaboration, coordination, and conflict, not all of which was resolved successfully as analysed below in section "VE as a gateway to culturally responsive pedagogical practice".

Second, due to the structure of the VE that relied on mainly horizontal as opposed to vertical integration (a theme explored in the qualitative analysis), teachers primarily interacted with each other and minimally with the student teachers. In contrast, the student teachers who were organised in international groups while also taking part in whole class discussions about the VE and the hearing from the panel of expert teachers, were exposed to a wider and more intense range of views and perspectives.

The *quantitative* analysis also showed no perceived change in participants' levels of motivation for teaching job/career and levels of isolation. The theme of isolation among teachers was explored further in the qualitative analysis and pointed to a redefinition of isolation in the study.

From the *qualitative* data analysis, three main themes emerged to clarify the participants' learning outcomes of relevance to the focus of this particular VE: (a) isolation redefined, (b) vertical and horizontal learning in VE, and (c) VE as a gateway to culturally responsive pedagogical practice.

Isolation (re)defined

Originally, isolation has been envisioned as a geographical condition in VALIANT; thus, VALIANT VEs endeavoured to reach teachers from rural areas who find themselves in geographical isolation and thus in need of professional support. Indeed, responding to the question on whether they consider themselves to be working in isolation in some ways, one of the teachers answered affirmatively:

> […], of course, due to COVID-19, and also compared to Germany. So, I live in a rural area and it takes me […] about 40 minutes to go to my university, driving […] I am sort of isolated, rural, especially through the COVID-19 situation, too.

While the geographical distance to the university may be considered long, it did not cause professional isolation for this participant. Later in the interview, for example, they disclosed information on extensive knowledge and experience of the digital tools for teaching and reported having organised or taken part in several VEs prior to this VE.

The second teacher interviewed, however, did not see isolation as a primarily geographical condition. Although they came from a small town in Slovenia, with a population of 15,000 people, their professional isolation did not stem from the town's rural location or the small size of the village school. In fact, the geographical location of their school on the border of three countries actually stimulated mobility and international exchanges between the schools in the area. This participant had long experience of national professional collaborations and Erasmus+ projects. Instead, their professional isolation stemmed from the ethnic homogeneity in the area. Because of the ethnic homogeneity, this participant considered themselves particularly ill-equipped, for example, to deal with the "poor Ukrainian boy" in their classroom:

> I'm in this place at this school where we don't have so many different students from different backgrounds. There are, perhaps, four. Yes. At the moment, there are four Romani students, and there are two Ukrainian students. And that's it. So, we are not so much involved in all this that's happening around us. We are quite, you know, there are some students that come from ex-Yugoslavia, and Serbians; but they, well, they somehow assimilate, so we don't see them as foreigners. So, the problem are [sic] those students that are not in this area. For example, these Romani students came a few years ago, and now the Ukrainian students came a month ago or something like that. But we are expecting more to come. So, that's why I wanted to learn from others. How do they deal with this? Because it is very difficult to have [such students] in the classroom.

Thus, despite a long history of national and international professional collaborations, the ethnic homogeneity of this teacher's context in itself became restricting and isolating. This take on isolation further develops Biardi and Nicholson's (2013) definition of social isolation as "the distancing of an individual psychologically, physically or both from his or her network of desired or needed relationships with other persons" (p. 83).

Vertical and Horizontal Learning in VE

This next theme we refer to is vertical and horizontal learning, which parallels the concepts of vertical and horizontal knowledge (see Klein,

2016). Analysis of the interviews and open-ended questions in the mid-VE surveys indicated that the organisation of this VE may not have satisfied either the teachers nor the student teachers.

For example, talking in face-to-face interviews about whether their expectations of this VE were fulfilled, the teachers mentioned that, at the start, they were rather expectant of the vertical exchanges with the student teachers and the horizontal exchanges with the other teachers. Further, both interviewees emphasised the benefits of horizontal learning among the teachers, which they saw as direct professional development and also as something they could pass on to their colleagues at home. However, both teachers also reported being disappointed in the fact that VE was not better organised to facilitate more collaboration. One of them expressed this sentiment rather strongly, in fact:

> What bothered me all along was that there wasn't really any true collaboration between us teachers […] We somehow didn't reach to each other…

The answers emerging from the open-ended questions paint a similar picture: most student teachers mentioned the need for more interaction with the teacher experts and more support in the VE design to collaborate better. One of the student teachers reflected:

> The synchronised meetings with the teachers did not feel useful at all since the students couldn't participate. I can't see the point of me knowing how the curriculum in Slovenia looks like when I don't know how I should use this information. I understand that the exchange is useful as a way to compare different systems, but the information did not link to the tasks at all.

From these responses, it becomes apparent that even in VEs organised specifically for vertical learning transfer between expert and students, teachers may be incentivised to stay when given more opportunities to collaborate with other teachers. This might be done, for instance, through collaboration around the development of materials or guidelines that teachers might find immediately useful and relevant to their context. This was successfully applied in a later VALIANT VE on supporting teachers of Ukrainian refugees (*covered in Chapter 2*), in which small groups of teachers assembled key resources and information in response to a specific issue they were facing in supporting the recent influx of Ukrainian students in their classes. This was later compiled into a mini-ebooklet that teachers received at the end of the VE and could use to enhance their teaching.

VE as a Gateway to Culturally Responsive Pedagogical Practice

Both teachers and student teachers in the VE reported having gained new knowledge of the content area of inclusion and diversity and insights into the different school systems. In addition, they learned about new digital tools and shared practical ways to deal with inclusion and diversity in their classrooms. However, given the diverse participant population in this VE, two students' responses stand out from the rest, albeit for different reasons. Their responses, in some ways, mirror the challenges described in Lawrence and Spector-Cohen (2018), whose VEs brought together those with varied levels of teaching experience. Reflecting on ways to improve VEs in the future, the first student teacher suggested:

> Participants have to be of similar or nearly similar teaching backgrounds. Participants shouldn't be of conflicting cultural, political, or religious backgrounds. Participants should be of similar age.

Despite having personal experience of VE work and particularly the content of this VE, this student teacher's suggestion seems to go against the foundations of VE philosophy and established pedagogy (O'Dowd, 2023). If anything, this participant seems to have been discouraged from exploring intercultural exchanges in the future. Although this is not common, it is important to acknowledge that some may show dislike for diversity, and we have not yet come up with one solution to such cases. It is possible that through longer exposure to VEs, the perspectives of this nature may shift especially if more positive experiences are gained. The second student teacher, on the other hand, voiced a strong standpoint, firmly steeped in VE philosophy:

> As I was trying to connect or reach out to my group, I noticed that it required a clear intention, giving steps, and perseverance. Will, action, and perseverance are things that I want to remember when trying to change things in my teaching practice. I do not want to give up on any of my students. I want to make them feel valued in my class, so I will be persistent in reaching out and getting to know them better and having them know each other. Develop a sense of community of belonging in the class.

For this and many of the other student teachers, their personal experiences of VE, possibly also because of its specific content on inclusion and diversity, led to professional growth. The sentiment expressed in the above response echoes not only theories of interculturality (Deardorff, 2020), but

also Culturally Responsive Pedagogy (Ladson-Billings, 1995). Although not an item explored in the pre- and post-VE surveys, the analysis suggests that for most student teachers, participation in a VE with a focus on diversity and inclusion can foster a new generation of teachers well-versed in ways of dealing with the changing world.

Summary and Recommendations for Other Practitioners

This case study focused on a VE that brought together teachers and student teachers on the topic of diversity and inclusion in the classroom and incorporated several organisational strategies to bridge the time zone and scheduling differences among participants. The findings point to several recommendations for other VE practitioners looking to develop similarly complex VEs linking teachers and student teachers.

Certain classroom management decisions had an impact on the overall engagement and limited vertical and horizontal learning that teachers and student teachers experienced. Specifically, when organising the whole group Zoom sessions where teachers were on an expert panel, student teachers were allowed to ask questions at the end of the session but not in breakout or small-group discussions. This was done to ensure that the UMBC students, who could not attend these Zoom sessions due to their work schedules, would be able to view the full recordings of the interactions, since breakout rooms are typically not recorded. However, small group breakout activities would have allowed more opportunity for in-service and student teachers to interact with each other, which would have supported greater vertical engagement among the majority of participants.

In addition, the graduate course in this VE included student teachers who were in fact themselves highly experienced teachers seeking additional credentials and who struggled with being positioned as "students" there to learn and not experts themselves who could share their own context's challenges and approaches to diversity and inclusion. This positioning may have served to limit what these experienced student teachers were willing to share in their small groups thus limiting the horizontal integration and learning opportunities within student groups. Recognising these participants' expertise in a more enhanced panel discussion that included

them in addition to the teachers may have increased their engagement and the teachers' overall intercultural learning since these experienced student teachers included those from other countries.

In conclusion, the participants benefited from the VE in different ways depending on their roles. Both the teachers and student teachers developed digital skills and team working skills. The student teachers demonstrated a gain in intercultural behaviour, while the teachers reported an increase in their self-efficacy and time management. Although neither group demonstrated a change in motivation or feelings of isolation on the quantitative analysis, interviews with two of the teachers uncovered that being able to share perspectives and connect with people from outside their existing local network helped alleviate a feeling of ethnic homogeneity in response to certain challenges faced in increasingly diverse classrooms. In addition, the tasks and structure of this VE was found to be an effective tool for preparing student teachers to carry out culturally responsive practices in their future classrooms.

Case Study 3: Virtual Exchange for Student to Student Collaboration

Andreas Kullick, Yolanda García Hernández, Avelino Corral Esteban, Adrian Jose Acosta Jimenez, Mónica Ferreira Mayrink O' Kuinghttons & Jekaterina Rogaten

Acknowledgements: We extend our sincere gratitude to Margarita Vinagre (UAM) and Carmen Platz (PHSG) for their exceptional coordination of the VE, which made this exchange possible. Their dedication and organisational skills were instrumental in ensuring the success of this transformative educational experience.

Context

The VE on *Integrating Technologies in the Foreign Language Classroom* was carried out between the University of Education Schwäbisch Gmünd

(PHSG) in Germany and the Universidad Autónoma de Madrid (UAM) in Spain. This VE was run between November and December 2022. In this VE, student teachers (undergraduate students) from PHSG collaborated with student teachers (postgraduate students) from UAM. The VE participation allowed participants gain experience in online collaboration with international peers, facilitate networking between university students from different European countries, share experiences, practices and ideas from different European classrooms, and develop a lesson plan with tasks and materials that fully integrate technology.

The VE was conducted in English and lasted for 5 weeks. This VE was integrated into a seminar on computer-assisted language learning (CALL) at PHSG and was part of a master's programme in linguistics applied to EFL at UAM. The VE had synchronous and asynchronous components, but they were not done in class. Each collaborating group had full autonomy in how they organised their synchronous and asynchronous communication and could use any of the tools they needed or wanted. Predominantly synchronous communication was done via Zoom and Teams. The asynchronous collaboration work was done using tools like Padlet and Google docs as well as messaging apps. In contrast to the VEs in case studies 1 and 2, this exchange had no structured sessions. Participants were instead assisted by the VE coordinators in structuring and troubleshooting their interactions by effectively using the VALIANT Moodle platform, email and the face-to-face in-class sessions.

Participants

Participants were all students at different levels of their formal education. Twenty-eight participants were undergraduate students from PHSG and 9 participants were postgraduate students from UAM, including 5 Erasmus students at PHSG and 3 at UAM. While the participants from PHSG were all studying to become teachers of English as a foreign language (EFL) for primary or secondary school, the participants from UAM were Master students who enrolled in the course Corpus Linguistics and New Technologies. The students from PHSG had little or no teaching experience, whereas the students from UAM predominantly had a teaching background.

The participants were divided into 7 working groups, so that 4 students from the PHSG and 1–2 from the UAM collaborated together in each group. Participation in the VALIANT research was voluntary and a total of 32 participants completed pre-VE, mid- and post-VE surveys (i.e., PHSG = 24; UAM = 8). In terms of gender, there were 7 males and the rest were females. Twenty-three students (79.1 %) were German, 5 students (15.6 %) were Spanish and the remaining 4 were from other countries.

How the Virtual Exchange Was Run

The VE was coordinated by three instructors who were teaching students in their respective courses. At PHSG there were two coordinators, while there was one coordinator at UAM. To keep the VE running smoothly it was essential that coordinators were in regular contact with each other to discuss the progress of the VE and any students' concerns.

During seminars (scheduled in-class activities) the coordinators provided guidelines (e.g., how to record Zoom meetings, work collaboratively on documents online, ways to share data, and how to use various apps for supporting foreign language learning), tasks instructions, and templates that the students could use to complete the VE tasks. The coordinators were available to answer any questions students had concerning the VE, provided individual support, and assisted with technological troubleshooting. They also provided additional support on request. Furthermore, all students at PHSG and at UAM received instructions on EFL teaching and learning. For example, they learned about and reviewed different approaches to CALL, analysed language learning apps, and were given examples on how to use apps to promote EFL learning.

In this VE participants had to complete 3 tasks. The main task (Task 3) was to design a lesson plan for a technology-enhanced foreign language lesson and to submit this plan to their coordinators at the end of the VE. To complete this main task, two other tasks (Task 1 & Task 2) had to be finished. This scaffolding followed the progressive model of VE task design (O'Dowd & Ware, 2009; Vinagre, 2017). Task 1 was an ice-breaker that students carried out individually, while Tasks 2 (information exchange and

analysis) and 3 (creation of a collaborative product) were done in groups. Below is the description of each task.

Task 1: Getting to Know Each Other

The first task was carried out asynchronously and individually. Students were given one week to complete it. This task consisted of two parts. In the first part, the students had to post a short multimodal presentation about themselves on Padlet. They were asked to briefly introduce themselves and tell the other VE participants about, for example, their personal background, hobbies, family, habits, or language learning and teaching experience. In the second part, the students were asked to post comments on the other VE members' presentations and to focus on what caught their attention and what differences they noticed compared to their own background and culture.

Task 2: Exchanging Language Teaching Experiences, Practices, and Ideas

The second task was carried out synchronously within each group. Students were given one week to complete it. In this task, the students had to compare and contrast their experiences and ideas obtained from the teaching activities. They had to arrange at least one online meeting (Zoom/Teams) with their group. In the meeting, participants discussed teachers' and learners' experiences in their respective countries. To complete this task students were given some guiding questions to go through "e.g., If you have already taught yourself, what are your teaching practice experiences? What are your experiences as a learner at school? What experiences – both as a learner and/or as a teacher – have you had with the use of technology in foreign language teaching?", which could help them to prepare for the synchronous online meeting with their group. Participants were allowed to add their own questions to the list and were asked to put a special focus on the use of technology in the foreign language classroom. The meetings were recorded and shared with their VE coordinator/s.

Task 3: Designing a Lesson Plan

For the third task, each group could decide if they wanted to carry it out (parts of it) synchronously or asynchronously. Students were given 3 weeks to complete it. Each group had to design their own lesson plan for a technology-enhanced foreign language class. To complete this task students had to get together with their group to decide if and when they would meet and which online collaboration tools they would use (Zoom, Teams and Google docs were suggested). The groups had to read and discuss the lesson planning guidelines. Based on the guidelines, they had to collaboratively plan a technology-enhanced lesson. Each group had to present the lesson plan in a standardised template and share it with their VE coordinators.

Learning Outcomes

The goal of this VE was to give students the opportunity to collaboratively work on tasks using online technologies. According to González-Lloret (2015), the fusion of technology and tasks holds a "unique learning potential" (p. 1). The VE aimed to use this potential to promote intercultural communication, transversal skills (time management, teamworking, problem-solving and negotiation skills), and digital attitude and competence development. VE coordinators were also interested in how students' motivation (intrinsic motivation and identified regulation[2]) for studying to become teachers and the feeling of isolation changed as a result of the VE participation.

Descriptive statistics were used to look at the perceived changes in the desired competences and skills. Taking into consideration the degree level and teaching experience of the PHSG and UAM students, the descriptive statistics were calculated separately for each class of students. The data

2 Identified regulation – is the second most autonomous form of extrinsic motivation. It is characterised by people consciously valuing a goal based on what is personally important to them.

from diaries and self-reflection videos submitted at the end of the VE were analysed qualitatively. The analysis followed a mixed methods approach (quantitative and qualitative findings).

The results of *quantitative* analysis showed that overall the largest improvement was in digital competences ($Md_{pre\text{-}VE\ survey}$ = 61.8; $Md_{post\text{-}VE\ survey}$ =72), identified regulation ($Md_{pre\text{-}VE\ survey}$ = 78.8; $Md_{post\text{-}VE\ survey}$ = 86), time management skills ($Md_{pre\text{-}VE\ survey}$ = 66.2; $Md_{post\text{-}VE\ survey}$ =73), and intrinsic motivation ($Md_{pre\text{-}VE\ survey}$ = 59.2; $Md_{post\text{-}VE\ survey}$ = 65.7).

It is important to acknowledge that there were differences between the two groups of students in their initial levels of the skills, attitudes and competences as well as in which areas they reported most improvement. Students studying at UAM had on average 6 points higher pre-VE survey scores across all skills, competences and predispositions than students from PHSG. The largest difference in the pre-VE survey between the two groups was in students' intercultural behaviour (Md_{PHSG} = 54.2 and Md_{UAM} = 71.3) followed by time management (Md_{PHSG} = 62.2 and Md_{UAM} = 72.8), and intercultural perspective (Md_{PHSG} = 76 and Md_{UAM} = 84.3). In addition to the pre- and post-VE survey measures that were used in the previous case studies, in this VE we also assessed if participation helped to develop a sense of community and belonging. Overall, all participants acknowledged that taking part in the VE made them feel less isolated and gave them the opportunity for professional support. Importantly, there were differences between the PHSG and UAM students in what they found most valuable in this exchange. PHSG students rated the impact of the VE higher than UAM students in relation to the VE helping them feel more connected and be part of the wider teaching community, whereas the UAM students rated the opportunity for professional development higher. Figure 9.4 graphically presents the median response score for each of the VE Impact on Isolation survey questions.

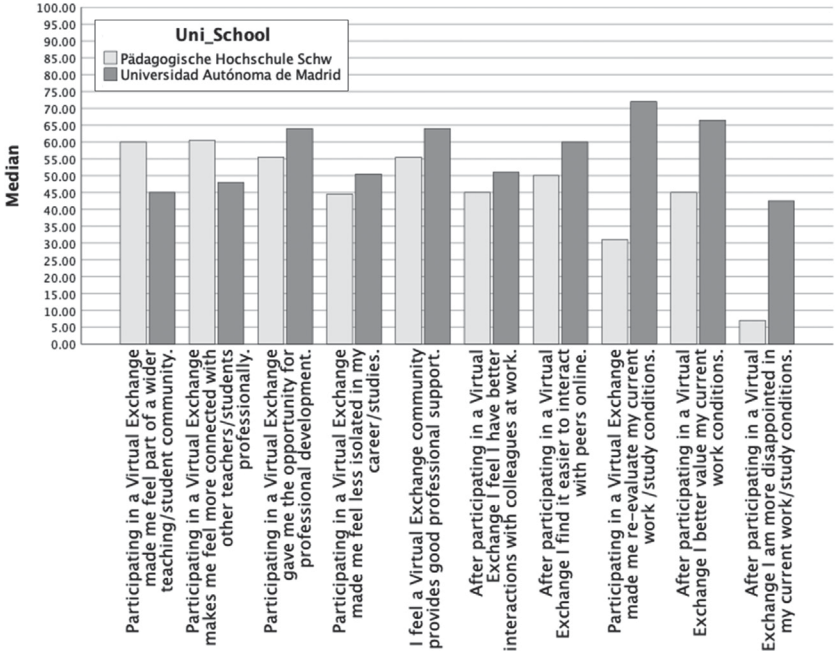

Figure 9.4: Comparison between the PHSG and UAM students responses to the VE Impact on Isolation survey

Overall, *quantitative* data analysis showed that this VE was effective in reaching its main objective as all students perceived improvement in their digital competences, identified regulation, and time management skills. However, there were some differences in what aspects of the exchange students found most useful for their professional development which could be due to the differences in age, education level, and teaching experience. From this perspective, it is possible to conclude that different groups of students benefited in somewhat different ways from the VE. To gain a better understanding of what participants perceive as valuable experience and learning from the VE, diaries and self-reflection videos were analysed.

From the *qualitative* data analysis, a number of themes emerged that both supported the quantitative findings and also identified additional areas of personal and professional development. The *qualitative* analysis identified 4 main themes: (a) digital competences development, (b) time management challenges, (c) professional development, motivation for intercultural collaboration, and self-efficacy, and (d) challenges in VE collaborations.

Digital competences development

The analysis of open-ended questions responses data showed that the VE helped students to develop a more favourable attitude towards the application of technology within language teaching and learning.

> Firstly, I was sceptic about gamification because in my experience it was not quite well implemented in my learning when I was a college student in my degree, but now I see it can be really useful if well conducted and people seem to like it.

This change in attitude towards technological resources relates to the development of the students' digital skills. The responses to the final open-ended questions showed that some participants recognised that the VE facilitated reflection on the use of technology in language teaching and the construction of new knowledge in the area.

> […] this experience, I think, has broaden my view about teaching/learning processes with technologies.
> I learned so many new tools with this course like Quizzlet, Kahoot, these tools I have never used before in my own classroom.

The testimonies of the students in their self-reflective videos also suggested that the development of their digital skills was based on the resignification of their previous experience with technologies. Namely, students were aware of the tools and some used them as students but they did not see how to use them in teaching before their VE participation.

> I was familiar with Kahoot but again I didn't necessarily know how to incorporate it into the classrooms.
> I didn't know how to do that (use tools) as a teacher […]. I wouldn't think of going into the platform and creating my own Quizzlet and my own Kahoot because I haven't learned how to use it […].

The above examples reinforce the importance that initial teacher education programmes should include tasks where the students (the future teachers) must experience the use of technology to successfully use it in their own classroom. The main benefit of it is that students have the opportunity to critically reflect on the technologies they learned about in the course and before possibly incorporating it into their own teaching practice.

> Using Kahoot to test students' vocabulary knowledge might be an interesting activity to be included in designing a lesson plan.
> I think the website Padlet is very interesting and useful. I am thinking that I can use it to help students learn vocabulary.

However, the data also revealed that there was a group of students who did not recognise that they had made any progress in their technological knowledge. They attributed this lack of digital competences development to their already existing experience of using digital tools and applications.

> There wasn't anything new just some common tools like Duolingo or Zoom.
> (learning) mostly of the tools I've already known.

Time management challenges

Students had full autonomy in organising the collaboration activities. They were responsible for making the decisions about work agenda, the location, time and mode (synchronous or asynchronous) of their meetings, the creation of common spaces for negotiation, and the solution of the various problems that arose during the different phases of the exchange. At first, few students perceived – or even anticipated – that to manage a work schedule with their classmates would constitute a challenge. Only 4 of the 32 participants alluded to this issue in the pre-VE survey.

> It will be difficult to arrange a proper time of meeting for everyone
> Coordinating schedules is always a challenge, so I anticipate that to be a challenge here.

During the weeks in which the VE was carried out, the issues of time management became central for most students (with no difference between PHSG and UAM students).

> The most difficulty I have experienced is determining a day and time that is suitable for the whole group to meet.
> It was chaotic to find a date for the meeting and there were some misunderstandings so that made the project more stressful to me.
> Look for tools or approaches to organise meetings with these members, we all have jobs or classes to go to or are busy […] How to organise the meetings among us […] it is quite a challenge.

However, despite the challenges faced by the students, all groups successfully completed their projects. Students acknowledged that the VE was a good learning experience that made them appreciate the importance of teamworking when faced with the challenging situations.

> I learned a lot like, how to organise the meetings, how to think of ways to finish the group work, because we all are from different places, we have to do this online […] I definitely found some new skills and learned so much. It was quite effective […]

Time management appeared to be the most challenging aspect of the VE and a large number of participants proposed ways to improve their time management. Several of the testimonies from students suggested integrating the VE into their schedule assigned to their regular teaching or reducing the number of participants in each group (ideally working in pairs) with the aim of reaching a consensus beforehand on the designation of the times allocated to meetings and joint work.

> I would like there to be a set time slot, in which all the groups have to do their meetings.
> […] allow WAY more time for the exchange to happen and line it up upfront with all universities that are partaking in such an exchange.

Professional development, motivation for intercultural collaboration, and self- efficacy

While it is obvious that the digital competences and time management were successfully enhanced by the VE participation, it is also worth highlighting that the participants' intrinsic motivation for intercultural collaboration also intensified. These findings were mainly evident through analysis of open-ended questions responses and self-reflection videos rather than quantitative data. Many participants showed an interest in the project activities for reasons other than obligation, necessity, external pressure, or desire for a reward or specific outcome. Participants expressed genuine interest in collaboration as it was an interesting activity, brought satisfaction, enjoyment, pleasure (specifically from meeting people from different cultures). They learned different cultural attributes (as reflected in language, history, music, and behavioural aspects, etc.), which could help to develop a more global knowledge of the world.

> I would like to experience new things and learn something about other cultures.
> I guess that I see myself in a more virtual education so having internet connections with other people from different countries it's make me feel like I'm achieving my goal that was being a innovative teacher.
> I like the fact that a lot of people are involved in this project and therefore our team can have a lot of ideas about how to improve learning and interaction with children.

We should also highlight the importance of developing a critical spirit and ability to reflect. The comments of the participants in the VE collected after the completion of the project show that students not only made advances in intercultural competences, but that they had also learned, as teachers, to include these competences in their class preparation.

> I learned new ways how to integrate intercultural competence into the classroom.
> I want to integrate more intercultural things for example other holidays.

Before starting the VE, the participants confirmed with their respective VE coordinators that they wanted both to practise English and to collaborate with students from other cultures. They had indicated interest in taking part in the VE as a chance to enhance their professional development through learning or exchanging knowledge or experiences and acquisition of new teaching strategies.

> I think that might be a great chance to share our perspectives on teaching aspects.
> I would like to learn how student teachers from other countries face challenges when teaching and how much they integrate technology in their lessons.

All these reasons go to show that there are many participants in VEs who not only seek a language exchange but are also convinced that VEs bring many other learning benefits associated with their professional activities, their development as teachers, the exchange of methodologies, and the strategies applicable to the classroom. This also led to the development of self-efficacy. Some participants stated that the VE had improved their competences in group work, a fundamental and highly influential factor in the success of students when teaching.

> I want to be more capable to be a teacher. And it's useful to learn the skills in this programme, as the pandemic makes online activities more necessary and frequent.
> Yes, I started teaching German to a boy and I had a few problems at the beginning, I discussed which methods would be more effective and I was able to get advice from my colleagues who, for example, already had experience in teaching.

Challenges in VE collaboration

In addition to the challenges associated with time management, it is important to note other problems that participants identified. These include lack of language skills and conversation topics, the artificiality of conversation due to the requirements to record the meetings and share those recordings, differences in the teaching and learning contexts, and lack of balance between the PHSG and UAM classes.

> The conversation was rather slowly. Sometimes nobody talked.
> The interactions felt pretty weird because we had to record them. Everything felt "artificial". However, as soon as we stopped the recording (and before we started it) the interactions were very natural and enriching.
> […] communication between teachers from different cultural background would cost efforts. Besides, different students and classes also would have different contexts that require variable solutions.
> A disadvantage was that there is only one student of the Spanish university in our group. It would have been more interesting if there were more students of different origin to learn more about the different school systems.

Summary and Recommendations for Other Practitioners

This study focused on VE collaboration among student teachers from two universities, with a specific emphasis on integrating technologies in the foreign language classroom. The VE collaboration aimed to foster the development of students' digital competences, facilitate the joint construction of educational and intercultural knowledge, and cultivate collaborative skills essential for their future teaching practice.

Quantitative and qualitative analysis revealed that the majority of learning occurred in the areas of digital competences and time management. Participants reported not only gaining proficiency in using online tools for teaching but also acquiring knowledge on how to effectively implement digital applications in the classroom. These findings are in line with recent results from O'Dowd and Dooly (2022), who found that teachers that participated in a European VE programmes developed enhanced teaching competences and innovative teaching methods.

However, it should be noted that more experienced students, who were already familiar with the tools, did not perceive significant growth in digital competences. To address this, it is recommended to form VE student groups with similar levels of familiarity and competences in utilising digital tools with the aim to enhance in-group homogeneity. In addition, content can be enhanced to ensure a greater variety of tools are covered in greater depth.

Time management emerged as a significant challenge faced by participants. Despite these difficulties, all tasks were successfully completed. The experience taught students valuable lessons in managing their individual and collective work schedules to meet established deadlines while problem-solving issues that arose during their collaboration. Student feedback suggested reducing autonomy regarding time management in setting up synchronous communication and establishing pre-determined meeting times organised by VE coordinators within the students' regular university study hours. Moreover, smaller group sizes may also facilitate easier negotiation of suitable meeting times, particularly in cases of time differences. The difficulties that student teachers have in finding timeslots for a joint online meeting in the context of a VE were also highlighted by other researchers (e.g., Hauck et al., 2021).

Participants expressed a strong interest in learning about different cultures and school systems in other countries, as well as a motivation to implement VE collaborations with their future students. However, the VE collaboration lacked cultural balance, with one class significantly larger than the other. To enhance the development of intercultural competences, it is recommended to ensure equal cultural presentations within each VE group.

Importantly, the VE collaboration fostered the development of self-efficacy and confidence among participants in their ability to teach. These were not assessed using pre- and post-VE surveys, but were evident through the open-ended question answers. Students highly valued the opportunity to share their individual experiences, enriching the overall group experience. Collaboration emerged as a crucial aspect that students were not accustomed to but considered essential for their future teaching practice. It is emphasised that collaboration serves as a valuable tool for successful knowledge exchange and the improvement of teaching quality.

In conclusion, the VE collaboration made a significant contribution to student teacher training, allowing for deep reflection on teaching practices and promoting collaboration among teachers, a fundamental aspect of their future professional lives. To optimise VE experiences, it is recommended to organise exchanges in a way that fosters reflection on teaching from various perspectives, encompassing technology integration, intercultural aspects, planning and evaluation, motivation, and self-efficacy.

References

Deardorff, D. K. (2020). *Manual for developing intercultural competences: Story circles*. UNESCO/Routledge.

de Jong, O. (2012). Empowering teachers for innovations: The case of online teacher learning communities. *Creative Education*, *3*(8), 125–129. https://doi.org/10.4236/ce.2012.38B026

Desimone, L. (2021). A primer on effective professional development. *Kappanmagazine.org, 92*(6), 68–71. https://doi.org/0.1177/0031721 71109200616

Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford University Press.

González-Lloret, M. (2015). *A practical guide to integrating technology into task-based language teaching*. Georgetown University Press.

Gutiérrez, B. F., Glimäng, M. R., O'Dowd, R., & Sauro, S. (2021). *Mentoring handbook for Virtual Exchange teachers. Strategies to help students achieve successful synchronous and asynchronous online intercultural communication.* Stevens Initiative. https://www.stevensinitiative.org/resource/mentoring-handbook-for-virtual-exchange-teachers/

Hauck, M., Satar, M., & Kurek, M. (2021). Where multimodal literacy meets online language learner autonomy: "Digital resources give us wings". In C. Fuchs, M. Hauck, & M. Dooly (Eds.), *Language education in digital spaces: Perspectives on autonomy and interaction.* Springer. https://doi.org/10.1007/978-3-030-74958-3_5

Helm, F. (2016). Facilitated dialogue in online intercultural exchange. In R. O'Dowd & T. Lewis (Eds.), *Online intercultural exchange: Policy, pedagogy, practice* (pp. 150–172). New York, NY: Routledge. https://doi.org/10.4324/9781315678931

Karavas, E., and Papadopoulou, S. (2014). Introducing a paradigm shift in EFL continuing professional development in Greece: the development of online communities of practice. In D. Hayes (Ed.), *Innovations in the continuing professional development of English language teachers* (pp. 179–206). British Council.

Klein, J. (2016) Teacher empowerment, horizontal and vertical organisational learning, and positional mobility in schools. *European Journal of Teacher Education*, *39*(2), 238–252, https://doi.org/10.1080/02619768.2015.1119118

Ladson-Billings, G. J. (1995). Toward a theory of culturally relevant pedagogy. *American Education Research Journal*, *35*, 465–491. https://doi.org/10.3102/000283120320034

Lawrence, G., & Spector-Cohen, E. (2018). Examining international telecollaboration in language teacher education. In D. Tafazoli, M.E. Gomez Parra, & C.A. Huertas-Abril (Eds.), *Cross-cultural perspectives on technology-enhanced language learning* (pp. 322–345). IGI Global. https://doi.org/10.4018/978-1-5225-5463-9.ch018

Luo, H., Han, X., Chen, Y., & Nie, Y. (2022). Should you become a leader in online collaborative learning? Impact of assigned leadership on learning behaviors, outcomes, and perceptions. *PLoS ONE, 17*(4), e0266653. https://doi.org/10.1371/journal.pone.0266653

Nowell, L. S., Norris, J. M., White, D. E., and Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*, 1–13. https://doi.org/10.1177/1609406917733847

O'Dowd, R. (2023). *Internationalising higher education and the role of Virtual Exchange*. Routledge.

O'Dowd, R., & Dooly, M. (2022). Exploring teachers' professional development through participation in Virtual Exchange. *ReCALL*, 34(1), 21–36. https://doi.org/10.1017/S0958344021000215

O'Dowd, R., Sauro, S., & Spector-Cohen, E. (2020). The role of pedagogical mentoring in Virtual Exchange. *TESOL Quarterly*, *54*(1), 146–172. https://doi.org/10.1002/tesq.543

O'Dowd, R., & Ware, P. (2009). Critical issues in telecollaborative task design. *Computer Assisted Language Learning*, *22*(2), 173–188. https://doi.org/10.1080/09588220902778369

Ortega, A., Sánchez-Manzanares, M., Gil, F., & Rico, R. (2010). Team learning and effectiveness in virtual project teams: The role of beliefs about interpersonal context. *The Spanish Journal of Psychology*, *13*(1). 267–276. https://doi.org/10.1017/S113874160000384X

Sifakis, N. (2018). Principles and challenges of ELF for EFL teaching and teacher education: the ELF-awareness perspective. In Cavalheiro, L. (Ed.), *Preparing English language teachers for today's globalized world* (pp. 27–45). V.N. Famalicão: Húmus.

Vadivel, B., Namaziandost, E., & Saeedian, A. (2021). Progress in English language teaching through continuous professional development – Teachers' self-awareness, perception, and feedback. *Frontiers in Education*, *6*, 1–10. https://doi.org/10.3389/feduc.2021.757285

Vinagre, M. (2017). Developing teachers' telecollaborative competences in online experiential learning. *System*, *64*, 34–45. https://doi.org/10.1016/j.system.2016.12.002

Zárraga, C., & Bonache, J. (2005).The impact of team atmosphere on knowledge outcomes in self-managed teams. *Organization Studies*, *26*(5). 661–681. https://doi.org/10.1177/0170840605051820

Pilar Garcés, Robert O'Dowd & Margarita Vinagre

10. Conclusions and recommendations for further implementation of Virtual Exchange in teacher education

Introduction

The VALIANT study examined the experiences of almost 700 teachers, student teachers and educational experts who took part in 24 Virtual Exchange (VE) projects focused on real-world educational issues. The different parts of this study looked at the impact of these VEs on various areas including participants' feelings of isolation, motivation, intercultural competence, professional development and digital competence. Through a series of case studies, we also illustrated how individual exchanges were structured and put into practice.

In this concluding chapter we review some of the most significant aspects of the VALIANT project and its study. In the first section we look at the experience of bringing researchers and public authorities together and what were the outcomes of this form of collaboration – one which is still not common in educational research initiatives. We then review the main findings of the study and reflect on the significance of these findings for teacher education programmes. Finally, we conclude with a series of recommendations for policy makers who are interested in integrating VE into their programmes of professional development.

The VALIANT Project – Bringing Researchers and Policy Makers Together

One of the most interesting characteristics of the Erasmus+ KA3 series *European Policy Experiments* is the manner in which it brings together

both researchers and regional and national public authorities in order to maximise the potential impact and scalability of innovative policy measures. In VALIANT, the participating ministries of education came from the autonomous regions of Castilla y León and Galicia in Spain, Baden-Württemberg in Germany, as well as from Portugal, Norway and Slovenia. Throughout the project, the ministries worked closely with the research team to set the research objectives and then to explore how Virtual Exchange could be most effectively promoted and integrated in teacher education across their regions and countries and in Europe.

Key to the success of the collaboration was certain shared concerns. First, there was a consensus that one of the main challenges to maintaining teachers' motivation and enriching their professional experience is the professional isolation caused by lack of networking and collaboration opportunities with other colleagues and experts. We were conscious that the absence of comprehensive support environments is particularly common in rural areas in Europe but also exists in other contexts. In the context of COVID-19, the issue of teacher isolation had become more pronounced than ever as teachers found themselves with reduced access to networks of professional support which could help them deal with their new teaching context.

Second, the consortium was also aware that there is a notable lack of collaboration and mentoring opportunities between in-service teachers and students of Initial Teacher Education in European education. While the benefits of connecting teachers and student teachers in collaboration and reflective discussion can appear almost obvious, there were very few reports of this taking place in any of the participating countries. This project was seen as an opportunity to remedy this situation as well as a chance to overcome teacher isolation.

Of course, working together in a project consortium which includes public authorities and academic researchers is not without its challenges. Both groups came to this project with different expectations and perspectives. While the academic group was focused on carrying out the VEs and then examining their impact, the public authorities were concerned with how such activities could be recognised and accredited in their national or regional systems and how the VALIANT networks could be maintained after the lifetime of the project. Furthermore, as the consortium discussed these issues, it became clear that different countries have different ways of recognising the professional development activities of their teachers. The

influence which ministries had in promoting a particular activity such as VE in higher education was also quite limited.

Nevertheless, it was still possible for some of the public authorities to achieve official recognition for participation in the VEs for student teachers and teachers. Previous KA3 projects related to VE had highlighted that a major barrier to the uptake of VE in education had been the challenges related to accreditation (EVOLVE Project Team 2020; the EVALUATE project group, 2019). In this project we ensured that students of Initial Teacher Education who took part in a VALIANT VE received a percentage of their final course grade for their work. In the case of teachers in primary and secondary education, the research team also worked closely with the public authorities to ensure that school teachers should receive recognition for their work. For example, Castilla y León awarded 2 credits equivalent to 20 hours training to teachers from their region who have taken part in the VALIANT exchanges. This certification was valid for obtaining their "sexenios" (a salary supplement that is obtained by certifying 100 hours every six years) as well as being valid for other regional, national or international calls in which participation in other European projects is specifically valued. This served as an example for the other public authorities who continued to work towards forms of recognition for their own teachers.

Slovenia also ensured recognition for their teachers for participation in VALIANT VEs. School teachers in Slovenia who were VE participants were able to submit the certificate they received at the end of the online training and attach it to the documentation of the regular procedure for professional advancement (a procedure which is administered at national level). The content of the certificate, compiled jointly by the partners, enabled Slovenian teachers to prove the duration of the activity, active participation, improvement of skills and acquired knowledge. In this way, participation in VE is identified as participation in Continuous Professional Development, which earns them points for their professional advancement and thus also helps them advance in their careers.

An issue related to the long-term sustainability of the VALIANT project was related to how to maintain a nascent community of practice of teachers and student teachers that had experienced the value of VE as a form of professional development. After having engaged almost 700 participants in 24 VEs, the consortium discussed ways in which this community of practice could continue to grow after the lifetime of the project.

With this in mind, the consortium explored the possibility of establishing an online platform where teachers and student teachers could continue to meet and engage in online exchange around educational issues. However, members were unwilling to take such an approach without having the funds to employ web managers and facilitators to promote discussion and to organise new VEs for members. It was decided instead to promote participation in The European School Education Platform (ESEP)- a new European platform for stakeholders in the school education sector including teachers, researchers and policymakers.

In summary, one of the major impacts of the VALIANT project was to achieve official recognition for teachers and student teachers that took part in VE programmes. We also developed a community of practice of teachers and future teachers who are expected in the future to go on and use VE themselves in their classes and as a form of professional development. In the following section, we look at the most important findings of the VALIANT study and consider their significance for the field of teacher education.

Most Significant Findings From the VALIANT Study

Quantiative findings from the study showed that for some of the variables tested (i.e motivation, intercultural learning) participants had initially scored very high and therefore, the VEs did not impact development significantly. Similarly, participants had reported low initial levels of isolation which indicated that the participants already knew how they could establish connections with other peers or colleagues in order to avoid feeling isolated in their professional environments. This would suggest that the VE programmes attracted a specific profile of teachers and student teachers who were already highly motivated (intrinsic motivation), experienced in intercultural learning and who did not identified themselves as isolated.

Quantitative findings for the other variables (i.e digital competences, digital attitudes, intercultural collaboration skills, intercultural verbal and non-verbal behaviour, intercultural perspective taking, self-efficacy and transversal skills (teamworking, problem-solving, time management and negotiation)) did show a significant improvement in participants.

Given that findings from the control groups showed no improvement, these findings can be solely attributed to the effectiveness of the implemented VE programmes.

The qualitative data analysis contributed to provide a wider and richer picture of the project's impact on participants. Findings showed that the VE programmes contributed to enhancing intrinsic motivation and suggest that acquiring new knowledge within the VE context and collaboration with peers were key aspects in this enhancement. Additionally, the shared experiences within the project and the collaborative efforts among the participants contributed to a notable enhancement in their motivation levels. Other positive outcomes are enhanced motivation towards performing professional tasks, an increased sense of self-worth and strong enthusiasm for their profession as teachers or becoming teachers. The participants were also willing to receive further training in the various topics covered by the VEs, and they displayed increased motivation to inspire and motivate their students.

As regards isolation, findings showed that there was a small but significant increase in feelings of isolation reported by some of the participants (i.e., the student teachers) after completing the VEs. This unexpected and somewhat contradictory outcome could be due to these participants' expectations that VE might be able to fully replace the value and expectations that they had for face-to-face socialisation and collaboration after enduring a two-year period of remote online learning due to the COVID-19 pandemic. Other contributing factors might have been the relatively short length of the VE program, the participants' hesitancy to openly discuss some topics or that participation of some members failed to meet expectations. The extra workload and time requirements related to VE participation may have also resulted in increased feelings of isolation. Teachers on the other hand, reported a significant impact of VE on their sense of belonging and support, and valued participation in VE as a great opportunity for professional development.

VE participants also reported a significant development in their digital competence. First, participants perceived notable improvements in their ability to navigate online networks, enabling them to effectively collaborate with other educators, develop digital resources and knowledge, and advance professionally. Additionally, engagement in VE appeared to enhance the digital attitude of both student teachers and teachers, even among those who initially held a positive mindset toward digital

technologies. This enhanced digital attitude was evident through the participants' increased value placed on digital technologies and their willingness to employ them, as well as their eagerness to involve their students in online collaborative projects. Furthermore, VE played a significant role in developing specific sub-competences, primarily related to interacting, sharing, and collaborating in digital spaces, identifying needs and appropriate digital responses, as well as creating digital content and creatively using technology. These outcomes can be attributed to the integration of tasks within the different VEs which focused on providing participants with opportunities to engage in meaningful interaction and collaboration.

The perceived development of intercultural collaboration skills also stood out in the qualitative data analysis. Overall, participants reported having developed their awareness of strategies for overcoming the challenges of online intercultural collaboration. Student teachers and teachers emphasised the importance of acquiring intercultural collaboration skills for the teaching career referring to specific aspects such as willingness, confidence and ability to work in intercultural teams as well as to work collaboratively online. The participants also reported being able to identify specific strategies in terms of intercultural communicative norms and styles and acknowledged the importance of attending to intercultural behaviour in teaching. In terms of perceived intercultural perspective taking, the VEs helped participants to overcome stereotypes and misconceptions about their international partners. Participants' reflections also revealed an awareness of the benefits that engaging in VE can present for teachers and student teachers and they valued the experience for helping them build their confidence and willingness to engage in intercultural communication and collaboration with peers and colleagues from other countries and cultures.

Findings also show that participation in the VEs resulted in an enhancement of the teachers' self-confidence in their professional abilities. The teachers experienced not only an increased sense of confidence in their teaching abilities but also a reaffirmation of their career choice. The elements contributing to this enhanced self-assurance included the validation of their current knowledge and instructional approaches, the acknowledgment that fellow teachers encounter similar classroom challenges, the realisation that their students benefit from the teaching methods recommended and employed during the VE, and the gratification derived from mentoring and empowering future educators. The student teachers

on their part, also displayed confidence in their potential to become skilled educators and teachers, experiencing an overall positive impact on their professional self-confidence. All participants increased their awareness of available international support networks and digital resources, which positively impacted their beliefs regarding their capacity to overcome challenges and find effective solutions.

Engagement in VE also brought a development of participants' transversal skills with the most perceived gain in time management and problem-solving skills. In the case of this last aspect, participants perceived the VEs had enhanced their ability to find effective solutions to overcome challenges. Participants also perceived positive gains in pedagogical skill development, including knowledge in the profession, learning and practising (new) digital tools, and having access to alternative perspectives and solutions to teaching problems which was achieved by understanding the realities of teaching and how to deal with them, at the same time they increased their knowledge of teaching methodologies through feedback from "experienced peers". Enhancement of other skills such as effective collaboration in online networks and improved digital and personal communication skills were also highlighted.

Finally, in order to investigate participant's perceptions regarding their VE experience, a satisfaction survey which was answered on a voluntary basis was sent to participants. Find below total number of answers per question together with means and standard deviations for all 3 rounds.

	N	**Min**	**Max**	**M**	**SD**
I feel I learned a lot from the Virtual Exchange	151	2	5	4.1	.99
I found the Virtual Exchange useful for my future career as a teacher.	97	2	5	4	1.09
I would recommend other teachers to do a Virtual Exchange if they have the chance.	54	2	5	4.6	.62
I would recommend other teachers students to do a Virtual Exchange as part of their training if they have the chance.	97	2	5	4.2	1.12
Overall I am satisfied with my Virtual Exchange experience.	151	2	5	4.2	1.01

Figure 10.1: Descriptive statistics for the end of the VE Satisfaction survey

In general results were very positive and encouraging. 79.8 % of participants agreed that they had learned a lot from the VE and 70 % found it useful for their future career as a teacher. 69,5 % would recommend other teachers to do a VE if they had the chance and 74,1 % would recommend other teachers to engage in VE as part of their training if they had the chance. The overall level of satisfaction with VE experience was very high (80,6 % of participants).

Upscaling Virtual Exchange in Teacher Education – Some Recommedations for Policy Makers

The tenet underlying the call for Erasmus+ KA3 European Policy Experimentation projects is to connect researchers and educational policy makers from various European regions to collaborate in applying academic research findings to the development of educational policies that promote interculturality and dialogue among all stakeholders in the educational world. Undoubtedly, one of the great successes of the project is that it has involved both in-service teachers and students training to become teachers. This bridge established by the project is one of the cornerstones of education. The cooperation between those who have become teachers and those who are aspiring teachers finds crucial support in this project to pursue a career in the field of education without barriers and with the necessary assistance to feel part of an educational network committed to creating a better world through communication, dialogue, and cultural diversity.

This example of participation of in-service teachers and student teachers in joint projects should serve as a model for those who design educational policies. In some cases, these policies are designed in separate departments following an organizational structure that prioritises departmental compartmentalisation. This approach leads to the development and implementation of differentiated measures that further widen the gap between active teachers and those who are preparing to become teachers. But in the project VALIANT, we find a way of connecting Initial Teacher Education and in-service school teachers in online collaboration about educational topics through Virtual Exchange.

Therefore, it is vital to insist on the importance of the different policy makers departments to work together in the development of digital, intercultural and transversal skills by supporting certain actions that will lead to a better understanding of the role of education in society. Collaborating closely with all involved stakeholders is the most compelling evidence that education has a promising future, and the teaching profession will be revalued and acknowledged. While it is true that administrative organization can sometimes hinder the design of policies that benefit all stakeholders in the educational realm, it is equally true that when the effort is made and bureaucratic rigidity is overcome, the results are remarkable, as demonstrated by this project. Therefore, in the project we can find a series of measures that educational authorities can undertake to promote a comfortable educational environment and enhance the digital and intercultural skills demanded by the international society.

First and foremost, we must acknowledge that Virtual Exchange is an effective tool for engaging in competence-based learning as well as evaluating competence development. Hence, one of the measures that policy makers should consider is the organization in teachers training centres of workshops, seminars, or conferences to train secondary and primary school teachers in VE. This measure would serve to strengthen collaboration between student teachers and experienced educators and to establish a robust network for developing joint projects.

Ministries could promote opportunities for Virtual Exchange practice at different levels in primary, secondary, and university education. This measure would be highly relevant at the international level, as collaboration across these three levels of education through Virtual Exchange necessitates the development of digital and intercultural skills at various levels, from which all can benefit.

Educational policy makers could organise various informal networking events to facilitate acquaintance among stakeholders across all three educational levels, thereby enabling the implementation of VE in diverse forums and activities. It is of paramount importance that the Virtual Exchange bridge remains stable, thus fostering collaborative efforts between educators and students. This represents the most humane and practical means of assisting teachers in avoiding feelings of isolation, burnout, or being misunderstood. The field of education is both captivating and challenging, yet at times, it can be overwhelming and isolating. Therefore, it is imperative that educators feel an integral part of an

educational community that does not compartmentalise but rather unifies and forms networks of support and encouragement.

Another measure that does not require significant investment but yields substantial educational benefits is the organization of mini-conferences and competitions based on innovative Virtual Exchange projects and their outcomes. These conferences and competitions not only reinforce the sustainability of Virtual Exchanges and their long-term viability but also serve as a stimulus for reflecting on the effectiveness of the Virtual Exchanges and proposing improvements. They encourage reflection and refinement.

At higher education level, universities could incorporate Virtual Exchange as a part of their curricula in Initial Teacher Education programmes and could give student teachers first-hand experience of Virtual Exchange through collaboration with teachers and other classes of student teachers. This would represent a revolutionary educational innovation that would aid competency-based assessment and the holistic development of digital and intercultural skills as an integral part of the curriculum.

At University and school level schools and universities could offer teachers badges or awards for internal promotion based on their participation in Virtual Exchange initiatives. This acknowledgment of academic institutions should serve as a stimulus for making educational innovation in the domains of digital, cross-cutting, and intercultural competencies a priority. In order to make this recognition effective, it would be necessary for those who receive it to enjoy certain advantages, such as specific funding for project maintenance or benefits for the school, department, or participant who is actively involved. These benefits could include facilitating physical mobility, prioritising their proposals in other areas, promoting the professional development of the teacher, providing infrastructure for the institution, among others. In other words, the recognition should have specific consequences for those who have worked on this cross-cutting methodology.

Lastly, but by no means less important, educational institutions, both at the university and primary/secondary levels, should integrate Virtual Exchange as a substantial component of their internationalisation strategy. This is not with the intention of replacing physical mobility with a virtual one but rather, conversely, to promote physical mobility through Virtual Exchange and encourage educators and students to experience the benefits of intercultural competence. Furthermore, this approach would enable

the institution to devise inclusive measures, as those participants who are unable to physically engage in international mobility can still do so virtually. This fosters equality among individuals and transforms the institution into responsible and equitable entities.

In conclusion, it can be asserted that public authorities, ministries and policy makers can and should consider Virtual Exchange as an innovative methodology that offers immediate benefits to all its users and, above all, should serve to elevate the status of educators within society. The VALIANT project has demonstrated that Virtual Exchange is a highly valuable tool for recognising the work of educators, a profession that requires fair social recognition. It is essential to remember that the word "master/teacher" derives from the Latin "magister," which means "one who knows more and shares their knowledge," while the word "minister" comes from the Latin "minister," signifying "one who serves others".

Hence, all strategies aimed at supporting the work of educators in guiding, advising, and maintaining an ongoing dialogue within the teaching profession will contribute to building a society with solid values capable of facing the future with the human dignity associated with obtaining a good education. The role of public authorities is precisely to ensure that this objective is met by adopting the necessary measures not only to support but also to stimulate initiatives such as Virtual Exchange.

TELECOLLABORATIVE LEARNING AND VIRTUAL EXCHANGE IN EDUCATION

Edited by
Melinda Dooly & Robert O'Dowd

This series focuses on the pedagogical processes and learning outcomes of engaging learners from diverse cultural and geographical backgrounds in online contact and collaboration for educational purposes. Emphasis is placed on innovative teaching and learning practices that leverage modern digital communication technologies to facilitate interaction, collaboration and intercultural learning. The activity is referred to in different academic contexts as Virtual Exchange, Collaborative Online International Learning (COIL), telecollaboration, Global International Teams and e-tandem among others. The series editors welcome proposals from authors using any of these different terms. Proposals related to Blended Mobility initiatives which combine online collaborative learning with short periods of physical mobility are also encouraged.

Telecollaborative learning and Virtual Exchange in Education deals with the application of these practices in different subject areas (e.g. Foreign Languages, History, Science) and in different educational contexts, including but not limited to primary, secondary, university and adult education.

A major aim of the series is to reflect the diversity of research and practice in this area of knowledge, providing a space for transversal dialogue among teachers and teacher trainers, administrators, researchers, and educators working in different subject areas as well as various areas of education.

Publications within the series include scholarly monographs and edited volumes as well as cutting-edge projects that exemplify good practice in the application of distanced collaborative efforts. Language of publication is English.

Volumes 1-6 have been published under the series name "Telecollaboration in Education".

Vol. 1 Sarah Guth & Francesca Helm (eds.)
Telecollaboration 2.0. Language, Literacies and Intercultural Learning in the 21st Century.
2010. ISBN 978-3-03943-0440-5

Vol. 2 Randall Sadler
Virtual Worlds for Language Learning. From Theory to Practice.
2012. ISBN 978-3-0343-0573-0

Vol. 3 Melinda Dooly & Robert O'Dowd (eds.)
Researching Online Foreign Language Interaction and Exchange.
2012. ISBN 978-3-0343-1155-7

Vol. 4 Nataly Tcherepashenets (ed.)
Globalizing On-line. Telecollaboration, Internationalization, and Social Justice.
2015. ISBN 978-3-0343-1520-3

Vol. 5 Claudia Grümpel & Analía Cuadrado Rey (eds.)
A Plurilingual Corpus on Telecollaboration in Third Languages.
2018. ISBN 978-3-0343-2792-3

Vol. 6 Melinda Dooly & Robert O'Dowd (eds.)
In This Together. Teachers' Experiences with Transnational, Telecollabo rative Language Learning Projects.
2018. ISBN 978-3-0343-3501-0

Vol. 7 Robert O'Dowd & Margarita Vinagre (eds.)
Virtual Innovation and Support Networks. Exploring the Impact of Virtual Exchange in Teacher Education.
2024. ISBN 978-3-0343-4752-5