VALIANT

Virtual Innovation and Support Networks

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Lead authors: Euline Cutrim Schmid, Robert O'Dowd, Jekaterina Rogaten, Marga Vinagre, Laura Torres, Anna Wärnsby, Urška Martinc, Dejan Zemljak, Begoña F. Gutiérrez

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About the VALIANT project:

VALIANT is a European Policy Experiment under Erasmus+ KA3 (EACEA/38/2019): Priority 3 - Strengthening teacher training and education by using the opportunities of new technologies (School education). The policy measure in this experimentation, Virtual Innovation and Support Networks, are defined as **Virtual Exchange programmes which bring together teachers, student teachers and experts in facilitated online collaboration around real-world educational issues**. VALIANT's first objective is to test the efficiency of Virtual Innovation and Support Networks as an approach which will contribute to overcoming teachers' sense of isolation and low motivation in rural areas and isolated contexts and also to developing teachers' ability to operate effectively in online international networks of professional collaboration. The second objective of the experimentation is to test the efficiency of this form of Virtual Exchange for providing students of Initial Teacher Education with access to the realities of the teaching profession through regular interaction with in-service teachers integrated into their study programme.

About this publication:

This research protocol contains a detailed description of the tools and procedures which are used in the VALIANT experimentation. It includes all the elements that have been recommended in the guide to social experimentation (J-Pal Europe, 2011): a) the principles and procedures for identification and selection of the groups of participants; b) the size, type, and features of the group of participants; c) the timing of the field trials; d) evaluation plans; e) the evaluation benchmarks and qualitative and quantitative indicators and finally f) the monitoring and quality control measures and ethical guidelines.

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Experimentation Protocol

Research Questions

The VALIANT project will evaluate the effectiveness and impact of Virtual Exchange on teachers considered to be working in contexts of isolation as well as on students of Initial Teacher Education in the participating European countries and regions.

The specific objectives of the project are to achieve the following:

- To overcome teachers' sense of isolation and improve levels of motivation through the networking and collaboration opportunities which emerge from participation in the Virtual Exchange programmes.
- 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.
- To develop teachers' ability to use digital technologies for elements of digital professional engagement, including professional collaboration, reflective practice and digital continuous professional development.
- 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.
- To provide practicing teachers and students of Initial Teacher Education with resources, support, and strategies for career path planning in order to maintain interest and engagement in the profession and empowerment in navigating their careers.

The guiding research question for the study is:

"Will participation in Virtual Exchange programmes contribute to teachers and student teachers' positive attitudes towards their profession and also to developing their ability to operate effectively in online international networks of professional collaboration – a vital skill for teachers in contexts such as COVID-19?

Roadmap of the Various Steps

The EPE methodology considers the following steps:

Step 1: Preparation

1. Identification and recruitment of the target groups in schools and in institutions from Initial Teacher Education in countries or regions which form part of the consortium.
2. Methodological design: Design of the research protocols for the field trials by the researchers.
3. Online survey of teachers and ITE professors to identify possible relevant themes for the Virtual Exchange programme.
4. Design of the virtual platform and pedagogical content of the Virtual Innovation and Support Networks.
5. Trialing and translation of research instruments.
6. Training of the online facilitators who will run the different Virtual Exchanges.

Step 2: Implementation:

1. Implementation: The implementation of Virtual Innovation and Support Networks (Three rounds of network activities carried out over three academic semesters).
2. Implementation: Collection and analysis of the quantitative and qualitative information from the field-trials by the researchers.

Step 3: Evaluation:

1. Analysis of findings in collaboration with public authorities to establish the level of impact of the networks on the development of the specified competences and sense of isolation and motivation.
2. As part of an Action Research approach, the networks will be adapted based on the findings of the first rounds of data collection.

Step 4: Upscaling and Dissemination:

1. In collaboration with public authorities, publication of findings and analysis and development and implementation of strategies for upscaling of the models of Virtual Innovation and Support Networks at national and European level.
2. Dissemination of the different models of Virtual Innovation and Support Networks and the results of the experimentation.

Sampling the Research Population

The principles and procedures for identification and selection of the groups of participants:

The sample population will consist of in-service teachers and student-teachers from the countries or regions whose public authorities are involved in the experimentation. The public authorities will work with their associate partners (i.e. national organizations for professional development) to recruit institutions and public schools who are interested in taking part in the experimentation. The focus will be on recruiting teachers from rural areas or from schools and universities of teacher education which the ministries believe to be in particularly isolated contexts. We define here isolated contexts as those where teachers may not have access to technologies and resources, training, or sufficient opportunities for collaboration with colleagues.

As the training courses for the experimentation will be in English (to facilitate communication between participants from different countries), it will be necessary for teachers to report at least a B2 level in English. Further iterations of the Virtual Exchanges can be offered in other international languages (e.g. French, German, Spanish) if there is an interest expressed in this possibility by participants.

Classes of Initial Teacher Education will be recruited from the participating universities as well as their networks. The members of the consortium have a large network of universities of teacher education stemming from the European Policy Experiment 'EVALUATE' which brought classes of ITE in Virtual Exchange together (EVALUATE, 2019). Furthermore, some of the academic partners in the consortium are ITE institutions and have initial teacher education courses for primary and secondary education. These partners will select at least 2 cohorts of students each to participate in the experimentation. These consortium partners were specifically selected to participate in the project in order to ensure participation and collaboration of a minimum number of institutions and to allow for a quick start to the experimentation. Some of the project partners will strive to recruit control groups in their contexts. The participants of the control groups in the pilot and second round of virtual exchanges will be given the opportunity to participate in the subsequent rounds.

Initially our intention was to have **at least 300 in-service teachers and 600 students of Initial Teacher Education** across the 6 partner countries (Spain, Portugal, Germany, Sweden, Slovenia and Norway) participating in this experimentation. However, since we already had 150 in-service teachers participating in the first set of trials, we are now expecting to reach a higher number of participants. No students and teachers will be 'obliged' to take part in the experimentation, all will be given the possibility to opt out. Permission will be requested from participants in order to collect the data and a form of consent will be used to that effect.

The Experimentation Methodology:

This research employs an experimental approach to examine the effectiveness of this Virtual Exchange programme. It will collect longitudinal data at three distinct stages (i.e. pre, post and after test). At each stage, both qualitative and quantitative data will be collected. The quantitative data from this longitudinal experimental approach will allow us to examine the causal effect of the intervention on feelings of isolation, motivation, self-efficacy, intercultural competencies, professional engagement and sustainable professional development. Quantitative longitudinal data

will be triangulated with the qualitative longitudinal data (participant diaries, interviews) to provide a comprehensive insight into the outcomes of the experimentation.

Research Participants

The data will be collected from three distinct groups of participants:

Group 1: In-service teachers working in rural education or other contexts of isolation.

Group 2: Students of Initial Teacher Education in the participating countries and regions of Europe.

Group 3: Control groups of Initial Teacher Education and in-service teachers in the participating countries and regions of Europe. As already pointed out, the partners will strive to recruit comparable control groups.

Quantitative data collection tools and instruments

The pre-test will assess all three groups of participants on their initial levels of motivation, levels of professional isolation, intercultural competence, self-efficacy, digital competences for professional development, and attitudes to technology and accessibility of technology.

The post-test includes all the measures used during the pre-test and in addition, for the test group (groups 1 & 2) it will also include qualitative assessment of engagement with Virtual Innovation and Support Networks as well as satisfaction with the programme as a whole. The engagement and satisfaction will be measured using a self-reported questionnaire that was developed for this study.

The after-test (6 months after completion) will only include test groups 1 and 2, and the survey will include the same measures as the post-test and will allow examination of the long-term effect of the Virtual Exchanges to better understand its effectiveness. Furthermore, working closely with the public authorities, we will also establish a mid- to long-term assessment procedure which will examine the continued impact of the VALIANT Virtual Exchange programme two-three years after the project has been concluded.

A quantitative survey was developed specifically for this project using items from a number of already existing validated scales as well as developing new items, which were also validated within the project as well as externally. Development of a new measure was deemed necessary, as there is no single measure that captures all the facets this research wants to capture. It was also important to consider the severity of changes that the education sector went through due to COVID-19. In the following, we provide more detailed information about the validated scales that were used in the design of the survey. All references are included in the bibliography.

*For the **Motivational levels subscale,*** we adapted items from 'The Multidimensional Work Motivation Scale (MWMS)' (Gagné et al., 2014). For the ***Levels of Professional Isolation*** **subscale**, we used the items on physical isolation and informational isolation from the 'Workplace Social Isolation' scale (Orhan et al., 2016) and the 'Social and Emotional Isolation from Loneliness at Work Scale and SELSA-S' scale (Ditomaso et al., 2004). For the ***Professional Collaboration in Digital Contexts*** **subscale**, we adapted items from the 'DigCompEdu Model' (Redecker & Punie, 2017).

For the design of the ***Intercultural Competence*** **subscale**, we used items from various sources: the cross-cultural collaboration items were adapted from the Stevens Initiative (2020) collection of VE survey items, the behavioral aspects from the cultural intelligence scale (Ang et al., 2007), and the perspective-taking and interest in learning about cultures items from the PISA Global Competence questionnaire (2018). For the **Transversal Skills subscale**, the teamwork and negotiation skills items were adapted from the eLene4work self-assessment tool (2021), the time management and problem-solving items were adapted from the 'Model of Soft Skills Assessment (MOSSA)' tool (Ducange et al., 2016). Finally, two validated questionnaires were used for the design of the **Teacher Self-Efficacy subscale**, the items for "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, 1997). The items for "Instructional Self-Efficacy" were adapted both from the teacher self-efficacy scale Bandura (1997) and the teachers' sense of self-efficacy scale (Klassen et al., 2009). Finally, the item "Self-efficacy for student engagement" was also adapted from Klassen (2009).

The survey was piloted and tested for its validity and reliability during pilot field trials conducted from September 2021 to December 2022 in most partner countries. As already mentioned, 150 in-service teachers and around 200 pre-service teachers took part in the first round of field trials. Seven virtual-exchanges were designed, implemented and investigated in the various partner countries involved in the project.

After the pilot phase, the survey will also be translated to some of the project languages, but only when deemed necessary to ensure reliability and validity of the used measures.

Qualitative data collection tools and instruments

The qualitative data will be collected using diaries and interviews only from 1) In-service teachers working in rural education or other contexts of isolation and 2) Students of Initial Teacher Education in the participating countries and regions of Europe (i.e., Groups 1 and 2). The diary entries will be collected using three rounds of open-ended questions, which will be sent digitally to the participants in the beginning, middle and final stages of the virtual exchange (Diary entries 1, 2 and 3). The main goal will be to collect in depth reflective thoughts on participants' own personal and professional development.

Some partners will conduct interviews with a random subsample of about 10-20% of participants from each group at the end of the Virtual Innovation and Support Networks programme as well as after 6 months following the completion of the programme. An interview protocol was developed to gain an in-depth reflection on the various components of the Virtual Exchange programme to understand what are the strong and weak aspects.

Therefore, the final evaluation of the effectiveness of the Virtual Innovation and Support Networks in reaching its objectives will be done by analyzing longitudinal quantitative and qualitative data from all three groups of participants.

The Three Rounds of Experimentation

Timing of Field Trials:

Before the first round of pilot trials begin in the winter semester 2021, both the treatment and control groups will complete the instruments for the quantitative data. The first set of pilot Virtual Exchanges will then be implemented in the winter semester of 2021. Qualitative and quantitative data collection will take place at the beginning, middle and end of this semester, with the researchers visiting the institutions where the experimentation is taking place and carrying out interviews with participants and the trainers. At the end of the winter semester the post tests will be administered to the treatment and control groups.

A preliminary analysis of the data gathered will allow the developers to fine tune the models of Virtual Exchange on the basis of the feedback gathered, so they will be improved for implementation in the subsequent two semesters with further groups of participants. To maximize this fine-tuning process, funding has been requested to bring five in-service teachers who have participated in the first round to the project meeting where the modules will be revised. At the meeting they will be invited to give input on their experiences and to make suggestions for improving the modules and research instruments.

Further quantitative and qualitative data will be gathered in two main trials in the summer semester 2022 and winter semester 2022/2023, which will follow the same procedure as for the first semester.

The following tables outline the dateline of the three rounds of experimentation and the timing of the field trials.

Pilot Study					
	15/10/21	**21/10/21**	**22/10/21** **14/10/21**	**20/12/21**	**01/06/22**
Experimental groups	**Pre-test 1**	**Start of treatment**	**Treatment**	**End of treatment and post-test 1**	**'After-test'**
Control group	**Pre-test 1**	**----------**	**----------**	**Post-test 1**	**----------**

Field Trial 1					
	08/02/22	**09/02/2022-**	**09/02/22 31/07/22**	**09/07/22**	**15/01/23**
Experimental groups	**Pre-test 1**	**Start of treatment**	**Treatment**	**End of treatment and post-test 1**	**'After-test'**
Control group	**Pre-test 1**	**----------**	**----------**	**Post-test 1**	**----------**

Field Trial 2					
	15/09/22	**21/09/22**	**22/09/22 14/12/22**	**15/12/22**	**01/06/23**
Experimental groups	**Pre-test 1**	**Start of treatment**	**Treatment**	**End of treatment and post-test 1**	**'After-test'**
Control group	**Pre-test 1**	**----------**	**----------**	**Post-test 1**	**----------**

Rationale and Implications:

The process of evaluating online learning communities is complex and various issues need to be addressed when choosing a research methodology. For this reason, the research team will follow the Commission's recommendations in the Guidelines for Conducting a European Policy Experiment (J-Pal Europe, 2016) and will use a mixed methods approach (Dörnyei, 2007; Nunan & Bailey, 2009) using both quantitative and qualitative data collection to measure the impact on participants' motivation, sense of professional isolation and aspects of digital competence related to professional engagement, as well as the impact of the Virtual Exchange on teachers' and student-teachers' career path and professional networks.

Data Analysis

Quantitative Data Analysis

The quantitative data analysis will be conducted using SPSS. All incomplete data cases will be removed. The dataset will be anonymized using the random participant-generated codes. The process of data analysis will involve:

1. Removing the responses from people who have failed to respond correctly to the testing question.
2. Computation of the variables
3. Testing the reliability of the scales
4. Checking dataset for the outliers and removing extreme cases

The descriptive statistics (means and SD as well as graphical representations of the data) will be used to explore the dataset and get the general understanding of the patterns in data. Inferential statistics such as t-test and ANOVA or their non-parametric alternatives will be used to test the research hypotheses (i.e., integrating Virtual Exchange programs into teacher training will provide the target groups (teachers in rural areas and student teachers) with an increase in intrinsic motivation, improvements in self-efficacy, digital competency, cultural competency, reduction in feelings of isolation).

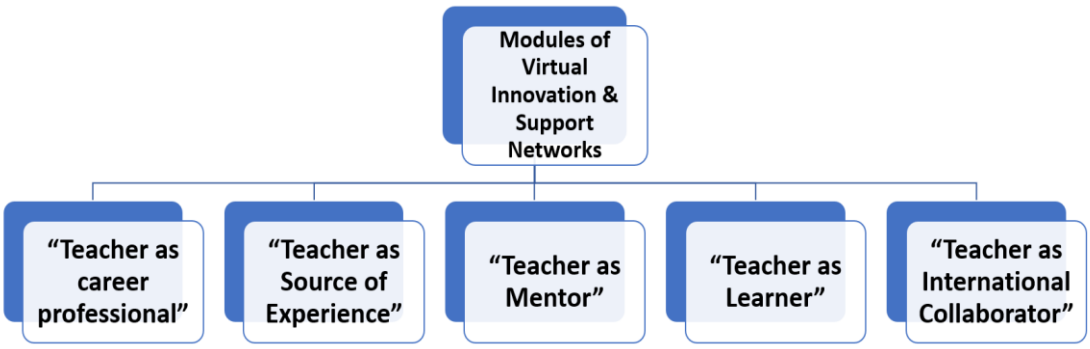
Qualitative Data Analysis

For the analysis of qualitative data, the consortium members will make use of two main approaches. Grounded theory (Glaser & Strauss, 1967) will be used for the topics (e.g. levels of isolation) that haven't been well-researched in our field and when it is considered difficult to draw upon specific theoretical frameworks for the data analysis. For the other topics, researchers are going to use thematic analysis (Braun & Clark, 2006) or qualitative content analysis (Hsieh & Shannon, 2005). The data will be analyzed by groups of researchers and inter-rater reliability will be tested. Software programs that aid in the qualitative analysis of data (such as NVivo and MAXQDA) will be used to support the process of coding and generation of prominent themes.

The Treatment

The treatment will involve engaging in-service teachers working in rural education or other isolated contexts together with classes of ITE students and invited experts in facilitated Virtual Exchange programmes entitled “Virtual Innovation and Support Networks”. These Virtual Exchanges will be configured in different ways (referred to here as modules) which will focus on key themes in education.

The different configurations of the Virtual Exchanges which will be tested include the following:



1. **“Teacher as Source of Experience”:** Virtual Exchanges involving in-service teachers in virtual exchange with students of Initial Teacher Education based on current pedagogical themes and issues. Students will use the information garnered from their interactions with the teachers from different countries to complete tasks for their studies. In-service teachers will benefit from the exchanges by learning about new tools and methodologies which students are studying in their classes.

2. **“Teacher as Mentor”:** Transnational mentoring sessions involving in-service teachers in virtual exchange with students of Initial Teacher Education who are completing their teaching practice to provide just-in-time teaching and mentoring in response to problems or challenges that arise in their classes.

3. **“Teachers as Co-Learners”:** Teachers from different countries share challenges and problems from their classrooms and compare how these are being dealt with in different countries, thereby sharing best practices from across Europe.

4. **“Teacher as International Collaborator”:** Guided support for in-service teachers as they learn to work with partner teachers in other countries to run international collaborative projects or to prepare eTwinning or Erasmus+ mobility exchanges as part of their teaching. These Virtual Exchanges can also involve experts or teachers who have had previous experience in successfully applying for and / or setting up projects.

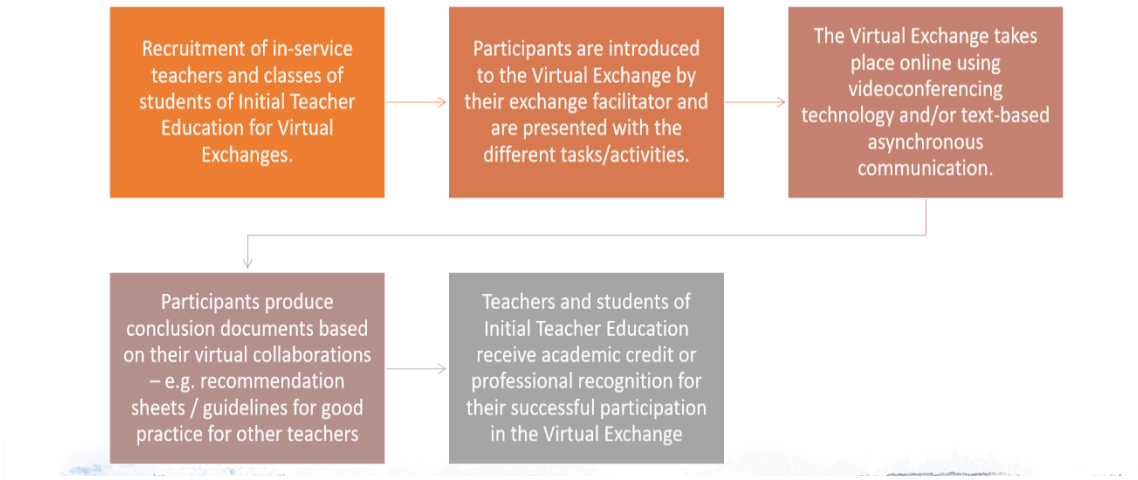
5. **"Teacher as career professional":** Virtual workshops featuring current and former master teachers, principals, education ministry members, teacher union leaders, and others to offer insights on hidden opportunities and challenges in teaching as well as strategies and resources to plan and navigate career systems, career management, and educational leadership opportunities.

Each of these Virtual Exchange modules will be supported by facilitators who have been trained to use video and text-based communication tools to facilitate co-learning among the participants (Edwards & Jones, 2003). These facilitators may be members of the participating universities in the consortium or, in the second round, they may be teachers who have participated in the previous round of the networks.

Each module will run over a period of 6-8 weeks, giving participants time to prepare for online sessions, to engage in tasks, background reading and to reflect on the outcomes of their collaborations. The facilitators will promote participant interaction (i.e. between in-service teachers from different nationalities as well as student teachers) that supports reflection on the learning process. The role of expert/non-expert will be dynamic given the participants role (e.g. discussion of conditions of teaching in rural schools would locate the experienced teachers as mentors in particular sessions, however in topics related to new technologies, student teachers may become the 'experts' in the exchange).

These modules will take place in a Virtual Learning Platform and will involve asynchronous text-based interaction and, if possible due to participants' internet bandwidth etc., synchronous videoconferencing sessions. Facilitators will structure the interaction each week, promoting collaboration and interaction between the different participants and guiding participants through the different tasks in the module. As the participants will come from different nationalities, different cultural perspectives on the themes and problems being worked on will be elicited by the facilitators, thereby promoting an intercultural approach to teacher collaboration. It is common in Virtual Exchange to have 2 or 3 national groups represented in online collaborations. We will aim to have this level of national mix as well in our exchanges.

The Virtual Exchanges outlined above would follow this proposed structure and format:



Quantitative Success/Failure criteria:

We expect a statistically significant difference between pre- and post-test scores of the treatment groups regarding levels of motivation, levels of professional isolation, intercultural competence, self-efficacy, digital competences for professional development, and attitudes to technology and accessibility of technology. A regression analysis will be performed to estimate whether the outcomes were due to the intervention rather than to other factors.

In terms of qualitative data, success criteria will be as follows:

In the post-exchange open writing tasks and interviews of the trainee-teachers in the 'treatment group' will demonstrate understanding of the issues which were treated in their training module and will express interest or openness to using virtual communities of practice as part of their professional careers as teachers in the future. Student-teachers reporting that participation in the Virtual Exchange made the teaching career more attractive to them will also be considered an indicator of success.

Finally, a further long-term indicator of success will be the extent to which in-service and pre-service teachers who participated in the experimentation go on to use contacts which they established during their Virtual Exchange to set up eTwinning exchanges or to propose Erasmus project proposals. This could be explored in future research. Some partners in the consortium may follow their own research interests and conduct follow-up studies. For instance, some partners plan to conduct qualitative linguistic analysis of the participants' text data.

Monitoring and Quality Control Measures:

The research partner at the University of the Arts (London) is not involved in the implementation of the exchanges. This way she is in a better position to provide an external evaluation of the Virtual Innovation and Support Networks which are carried out. As regards the research process, all academic members will review one another's work and that of other partners in the process of data collection and analysis – both the statistical analysis and also in the coding of qualitative data.

After each phase of data collection and analysis, the research team will review the data gathering tools and methods and will adjust them if necessary, for the second round of data gathering.

Peer evaluation plans:

In order to ensure a rigorous approach to quality control in the phases of design, data gathering and statistical analysis, the project leader has appointed one external peer reviewer. Dr. Shannon Sauro holds positions at University of Maryland, Baltimore County and at Malmö University, Sweden. She has extensive experience in European KA3 projects such as the European Project Experiment 'EVALUATE' and the forward-looking project 'evolve' (EVALUATE, 2019; Evolve 2021) . Both projects also focused on evaluating the impact of Virtual Exchange.

Ethical guidelines:

The experimentation will be undertaken within a structured framework which will include assessment by the University of the Arts London's research ethics committee. It will thus be

governed by, and adhere to, University of the Arts policy including the guidelines on the University's website:

https://www.arts.ac.uk/research/research-standards-and-ethics/

In some cases, when necessary, the ethical guidelines will also be evaluated by the ethics committees of specific partner universities (e.g. Universitat Autònoma de Barcelona).

Intellectual property rights:

In order to maximize 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) will be produced as Open Educational Resources (OERs) and Open Educational Practices (OEPs). These will be translated into the project languages (Spanish, Portuguese, Slovenian, German, Swedish and Norwegian) and will be made accessible to future in-service teachers in remote areas as well as to student-teachers. 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, but not only for the ones who will be recruited for the purposes of VALIANT, but also for a bigger number of teachers who will be able to reuse the project's outputs.

The final EPE report will be published by Research-publishing.net which has been established as a not-for-profit organization since September 2010, and which is committed to making peer-reviewed research papers a freely available public resource. (https://research-publishing.net/)

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Members of the VALIANT consortium

universidad de león	Universidad de León	Spain
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Pädagogische Hochschule Schwäbisch Gmünd University of Education	Pädagogische Hochschule Schwäbisch Gmünd	Germany
ual: university of the arts london	University of the Arts London	UK