Anchored Instruction in Teacher Training in Focus of Education for Sustainability:

Experiences and Results of an Erasmus+ Project

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Abstract. Studies have identified multifactorial criteria for effective, sustainable teacher training (e.g. Lipowsky & Rzejak, 2021). These may include the following: orientation towards the latest teaching research; focus on central teaching requirements; strengthening collegial cooperation; linking input, testing and reflection phases; feedback and coaching. Against this background, the article presents the concept and design of a teacher training program from the Erasmus+ project 'Second Language Learning for All Teenagers at School'. This project aimed to improve the oral skills of foreign language learners in France, Italy, Spain and Germany, since international communication skills are key for professional success and social integration (SDG). In order to achieve this, teachers must consider the social, emotional, cultural, neurological and linguistic skills of their learners, which in this case included both foreign language and second language learners at the high school level. The latter group was made up of a high number of immigrant students, where language learning needs are particularly acute and students' base level may be varied. The training included six pre-tested interactive online courses using the 'Anchored Instruction' approach, analyzing fictitious or real teaching situations for concept change (Cognition and Technology Group at Vanderbilt, 1997). It also offered international workshops for reflection and exchange, plus online tutoring to support trainees and monitor their progress. The design aligned with ESD goals and integrated key elements of DigCompEdu and GreenComp. The article presents results and experience reports from the training program and formulates design features for international teacher training courses.

K. Becker et al. (eds.), *Proceedings of the Conference Growing up the Future: Education for Sustainability (GROUFES 2026)*, Atlantis Highlights in Social Sciences, Education and Humanities 54,
https://doi.org/10.2991/978-94-6239-760-6_21

Keywords: anchored instruction, teacher training, international program, ESD, SDG, language learning

1 Introduction

Education for Sustainable Development (ESD) refers to the integration of sustainable development issues into education at all levels, "empowering individuals with the knowledge, skills, values, and attitudes to address global challenges" (United Nations Educational, Scientific and Cultural Organization [UNESCO], n.d.). ESD and teacher training are intrinsically linked, since teachers play a crucial role in fostering a sustainable future by educating the next generation. On the one hand, teacher training is essential to equip the teachers with the knowledge, skills, and pedagogical approaches to integrate ESD into their teaching. On the other hand, an effective teacher training in the scope of ESD needs to follow the „shift from teaching to learning", which means supporting "self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinarity and the linking of formal and informal learning" (UNESCO, 2017, p. 7). Studies have already identified that effective teacher training needs to follow multifactorial criteria, for example, orientation towards the latest teaching research; focus on central teaching requirements; strengthening collegial cooperation; linking input, testing and reflection phases; feedback and coaching (e.g. Lipowsky & Rzejak, 2021). By implementing these criteria, teacher training programs also combine key elements of the European Greening Curriculum Guidance UNESCO, 2024) with elements of the European Digital Competence Framework for Education (DigCompEdu). The DigCompEdu framework identifies six key components of digital competence for teachers: Professional engagement, Digital resources, Teaching and Learning, Assessment, Empowering learners, and Facilitating Learners' Digital Competence (Redecker, 2017, p. 8). To address these competences, an action-orientated teacher training program was developed. Action-orientation is one of the key principles of greening education in formal, non-formal and informal settings. The aim is to empower learners in a learner-centred pedagogy, which also shows relations to their (future) career or workplace and leads to transformative thinking and acting (cf. UNESCO, 2024, p. 21).

This article presents the concept, design, and first results of an international in-service teacher training program, 'Second Language Learning for All Teenagers at School' (SLS4Teens), which followed those previously mentioned key elements of sustainable teacher training. Finally, design features for international teacher training courses will be formulated.

2 International in-service teacher training program SLS4Teens

2.1 Objectives

The teacher training project SLS4Teens aimed to equip foreign language teachers from France, Italy, Spain, and Germany with knowledge, skills, and pedagogical approaches to improve the oral skills of their learners, which in this case included both foreign language and second language learners at the high school level. The latter group was made up of a high number of immigrant students, where language learning needs are particularly acute and students' base level may be varied. In order to improve this varied group of learners' oral skills, teachers must consider their social, emotional, cultural, neurological, and linguistic skills.

The training included six pre-tested interactive online courses, offered international workshops for reflection and exchange, alongside online tutoring to support trainees and monitor their progress, features that are increasingly emphasized in international models and researches of continuous student and teacher professional development.

Education in Sustainable Development is based on five educational core competencies, which are: learning to know, learning to do, learning to live together, learning to be, and learning to transform oneself and society (UNESCO, 2017). Teachers and teacher-trainers should be able to adeptly weave these competencies into the fabric of their day-to-day teaching so as to promote autonomy, critical thinking, lifelong learning and social cohesion that supports integrative and future-forward education. Socio-emotional or psychosocial skills, also known as life skills or soft skills, play an important role as well, because they are considered to be 'health determinants', as stated by the World Health Organisation (WHO) since 1993.

We can also consider the connection between SDGs and language education, in particular. For example, in terms of SDG 4 (Quality Education), modern language pedagogy emphasizes "Global Citizenship Education" (GCED). According to Byram (2021), language learning is not just about vocabulary but about developing "intercultural communicative competence", allowing individuals to decenter from their own cultural perspectives to engage ethically with others. Intercultural competence in fact has been called by some scholars the "5th skill" of language learning (Hong, 2008; Tomalin & Hurn, 2013). Additionally, research by Osler and Starkey (2015) suggests that multilingualism promotes inclusive societies, which addresses SDG 10 & 16 (Reduced Inequalities; Peace and Justice). When learners study a new language, they gain access to different worldviews, which reduces xenophobia and builds the "intercultural dialogue" necessary for peaceful cooperation. This is also positive for economic and social sustainability, which the UNESCO (2017) framework for ESD identifies in the crosscutting competency of "intercultural understanding". By bridging the gap between different linguistic groups, learners can collaborate more effectively. In this sense, language learning may be conceived as the "connective tissue" of many SDGs; it provides the cognitive and empathetic tools necessary to transform global goals into local actions through respectful, cross-border communication. Recent studies have explored this

connection, for example Sun (2025) demonstrated how exposure to sustainability values through language learning enabled university students to engage with diverse perspectives on social and environmental issues. Finally, Reisinger et al. (2021) propose a framework that utilizes language teaching to develop critical thinking, social responsibility, and ethical conduct – key elements for sustainable development.

The teacher training developed in the SLS4Teens project aligns in general with these competencies, with its focus on continuing education for in-service teachers, its dynamic and social context with both live and asynchronous learning, and its target of secondary school language education. The training content itself also addresses some of the gaps detected by UNESCO in GAP Priority Action Area 3 (UNESCO, 2017, pg. 54), which is to integrate ESD into pre-service and in-service teacher education programs, since the program in its pilot and later implementation stages worked with both these populations.

Specifically, the training includes particular ESD learning objectives for teacher training (UNESCO, 2017), such as examining how cultural diversity can form part of the integral elements of the educational processes, which was seen in the Intercultural Competence module of the SLS4TEENs training. Another example of how ESD learning objectives for teacher training align with the module content can be found in both the module on ICTs for language teaching and the pedagogy of actively using ICTs for the training transmission, which is a sustainable practice itself that reduces the need to travel by offering a hybrid learning experience, as well as supporting technological innovation across diverse cultural, linguistic, and educational settings. Finally, the interdisciplinary nature of the modules, which offer perspectives on the topics already mentioned as well as integrated grammar teaching, assessment and evaluation, and the affective and neurological component of language acquisition, looks at secondary language learners holistically, asking in-service teachers to meet them where they are and as they are. This echoes the target of the SDG4 (ensure inclusive and equitable quality education and promote lifelong learning opportunities for all), as well as its target 4.4 to reach youths with education that offers them skills for the future, of which language and ICT skills are paramount in an increasingly globalized landscape.

In this article, we focus on presenting concept, design, and evaluation results of the online course.

2.2 Methodology

The online course consists of six modules, which were – on basis of the latest teaching research – determined to be relevant for increasing the oral skills of language learners: Information and Communication Technology, Intercultural Communication, Neuroscience-based language teaching and learning, Affective factors in motivation, Grammar teaching and learning, and Assessment and evaluation of oral production. Each module consists of a basic and an extended module and used the ‘Anchored Instruction’ approach.

The framework of the anchored instruction approach was developed by the Cognition and Technology Group at Vanderbilt (CTGV) in the 1990s. Its goal is to “overcome the inert knowledge problem” (CTGV, 1990, p. 3) and to help learners become actively

engaged in learning by situating, or anchoring, them in interesting, realistic and relevant problem solving environments. As Li et al. (2023) explain regarding the theoretical foundations of anchored instruction, citing Vye et al. (1990):

> anchored instruction, also known as problem-based teaching or case-based teaching, is a teaching mode based on constructivist learning theory. They point out that anchored instruction emphasizes a problem-oriented core, helps students discover problems in a relatively real teaching context, produces various learning needs, and lets them experience the entire process from problem discovery to problem solving through independent study and cooperative learning. (Vye et al., 1990, p. 224-225).

Usually, the stages of Anchored Instructions are as follows, where every step or phase is "distinct and sequential, each contributing to the process" (Baumbach et al., 1995, p. 810):

Phase One:	Introduce the anchor.
Phase Two:	Develop shared experience around the anchor.
Phase Three:	Expand the anchor.
Phase Four:	Use knowledge as tools for problem-solving.
Phase Five:	Work on projects related to anchor.
Phase Six:	Share what was learned.

The Vanderbilt Group used the approach for young learners and then decided to use videos to introduce the anchor for many reasons, but especially to include "low-achievement students" and "students with little knowledge in the domain of interest" (CTGV, 1990, p. 3). Since our teacher training program focuses on adults and well educated teachers in their fields, we decided to present the anchor in a textual format but with the support of pictures.

To be more precise about what anchored instruction is, let us take the example of Module 4, Affective Factors in Motivation.

Both the basic module and the extended module follows the principles of anchored instruction described above. As its name suggests, the basic module was designed to provide the foundations on a specific theme. In the case of the modules for teacher training here, the case study is a real situation occurring in the classroom and related to the module under study.

The extended module builds upon the basic one. It develops and deepens the notions and concepts presented earlier through concrete activities, still closely connected to the initial case study. We organized the theoretical concepts around the six different phases (described above) that the 51 teachers participating in the project were expected to follow throughout the module.

The first phase, *Introduce the Anchor*, allowed the presentation of two case studies. These situations were chosen collaboratively with language teachers and are intended to be as authentic as possible, directly linked to experiences actually encountered in language teaching. The first case describes a conflictive situation between Paul and his English teacher, Laure, which has escalated to resulting in the student being asked to leave class. The second case depicts Mélissa and her French second language teacher,

Yann, where the teacher feels completely powerless after several weeks of facing the student's persistent silence and refusal to speak in class.

The second phase, *Develop shared experience around the Anchor,* allows teachers to share their experiences around this anchor through forums, where they had to explain how they would have reacted in the place of Laure and Yann.

The third phase, *Expand the Anchor*, makes it possible to connect the two classroom situations to numerous concepts and theories related to the following five themes:

- Obstacles to students' affective-emotional security: fear of how others will perceive them and fear of making mistakes.
- Managing conflict situations: expressing one's own emotions and taking pupils' emotions into account.
- Developing the pupil's identity: telling their story and experiencing themselves through their own emotions and those of others.
- Motivating learners: encouraging positive emotions in class and enhancing students' sense of competence.

The fourth phase, *Use Knowledge as Tools for Problem-Solving*, is present in the module through the experimentation of activities designed to implement positive emotions in the language classroom. Teachers are required to test these activities and share the results of their implementation with others via forums.

The fifth phase, *Work on Projects Related to the Anchor*, corresponds to experimenting with the module's contributions in their own classroom with their students. This requires teachers to make a series of adaptations in order to implement what they have learned, taking into account the affective-emotional dimension within their classes to improve oral proficiency.

The final phase, *Share What Was Learned*, is carried out throughout regular follow-up-sessions within small groups together with persons from the project team.

2.3 Research Design

To make sure that the concept and design of the modules will contribute to the achievement of the objectives of the training program, they were pretested with master students (pre-service teachers) from our universities in November 2024, where each student had to evaluate three modules. Each module was tested by at least up to eight persons. Apart from questions about length, technical problems, misunderstandings, the pre-service teachers were asked to rate the design and its methods, for example, if the modules took active learning into account, or focused on relevant challenges.

Results from the pre-test were implemented. The teachers finished the basic modules within five weeks and the extended modules within 18 weeks. Afterwards they were asked to rate the course. We only consider now those items of the questionnaire which were used to evaluate the anchor instruction approach. This includes the above-mentioned items, supplemented by the question of whether the modules taught new methods. Additionally, one item specifically asked them to evaluate the case-study effect, another referred to the relevance of the training for the professionalization of the teachers' teaching practices. Finally, the teachers rated the overall teaching program.

2.4 Results

In total, 51 in-service teachers participated in the training, where 41 evaluated the online course (of which 28 evaluated also the extended modules) and the training in general. In the following, the results are presented based on the four criteria for action-oriented pedagogy (cf. UNESCO, 2024): empowering; learner-centred; career-related; transformative.

With regard to the first two criteria, overall, the in-service teachers rated the didactics of the basic modules positively (see table 1). The results show that approximately half of the teachers agree that the target criteria for the basis modules are fulfilled. With regard to the extended modules, the approval ratings are even a bit higher than for the basic modules, but respondents do not seem to be fully convinced that these modules offer sufficient opportunities for interactive, collaborative and cooperative work.

Table 1. In-service teachers' evaluation of the modules.

	Provides active learning	Focuses on real and relevant challenges in practice	Promotes critical thinking	Teaches new methods	Is interactively designed	Is collaborative and cooperatively designed
Basic Modules	41.46 %	46.75 %	46.34 %	56.91 %	/	/
Extended Modules	43.75 %	55.56 %	50.00 %	59.72 %	34.72 %	40.28 %

With respect to the anchor instruction approach, which was planned to fulfill the other two criteria of action-oriented pedagogy – career-related and transformative –, 82,93% of the survey participants noticed the case-based studies and rated them as highly motivating, relevant, encouraging and useful (see table 2). In total the case-based examples reached a total score of 3,94 on a five-point Likert scale. Nevertheless, the standard deviation for the items "distraction/misleading" and "time" suggests that teachers evaluate the case studies very differently.

Table 2. Evaluation of the Anchor Instruction Approach (1 = *does not apply at all* to 5 = *fully applicable*). *scale is inverted

The case-based examples …	Average rating (scale: 1<5)	Standard Deviation
... were motivating/activating	3.90	0.81
... have strengthened the practical relevance	3.97	0.89
... were distracting/misleading	3.92*	1
... were realistic/authentic	3.90	0.81
... have encouraged people to reflect on their own practice	4.13	0.91

... have given new input for my teaching practice	3.90	0.99
... helped me to better understand theoretical content	4.21	0.82
... were trivially designed	4.10*	0.96
... were too time-consuming	3.36*	1.19
... had too little value	4.03*	0.97
In total	3.94	

In terms of the general training, the teachers indicated that the training was relevant for their teaching professionalization with an average of about 4 out of 5 points. In total, the training was rated highly in terms of quality, reaching a total score of 3.83 (see table 3). The participants would recommend the training in general to someone else with a likelihood of 76%. The Standard Deviation (see table 3) shows that there are only minor deviations among the rating of the teachers, but especially concerning "cooperation" and "feedback".

Table 3. Valuation of the overall teaching (1 = *not fulfilled at all* to 5 = *fully and completely fulfilled*).

Quality criteria	Average rating (scale: 1<5)	Standard Deviation
orientation towards the latest teaching research	3.95	0.73
focus on central teaching requirements	3.81	0.80
strengthening collegial cooperation	3.59	0.94
linking input, testing and reflection phases	4.11	0.61
feedback and coaching	3.68	1.12
In total	3.83	

3 Discussion & Reflection

According to the teachers' evaluation the training in general meets the quality criteria by Lipkowski & Rzejak (2021), so that the training can be considered successful and based on a high scientific standard. A closer look reveals a number of aspects that appear to be relevant for the implementation of international teacher training programs.
Firstly, the results indicate that although the didactic design might require some changes to address a need for further integration, the training was seen by participants as contributing to the overall sense of cooperation. This may be related to the fact that

training did include one face-to-face phase, where they met with their international colleagues over two days, which is often perceived as being more effective than simple online training (Siddiqui et al., 2024). Face-to-face-workshops seem necessary, in line with the fact that "educational experiences are maximized in an […] environment composed of instructors and students who demonstrate critical thinking, interpersonal and interaction skills" (Bush et al., 2010, p. 8). Furthermore, "valuable learning in online and blended courses (requires) interaction between social presence, cognitive presence and teaching presence" (Bush et al., 2010, p. 8). Yet, in an international environment of the sort like the one this study took place in, live opportunities to meet may not be frequent. In this sense, this combination of online learning and interactive learning may be a difficult balance to strike, and remains a didactic challenge for future teacher training courses.

In terms of the anchor instruction approach, the results show that this was generally motivating and activating for them. On the other hand, the evaluation of the case studies present the highest standard deviations when these were defined as time-consuming and distracting, which points to a lower rate of agreement among the respondents in comparison to the answers related to more positive perceptions. Nevertheless, the project clearly shows that teacher training is successful when using anchors in real situation to support theoretical learning and mediation of (new) methods for implement the learning in lessons.

4 Conclusion

This project provided valuable insights into the design and implementation of the six training modules intended for in-service secondary school teachers for foreign language teachers. The results highlight several strengths as well as areas for improvement that can guide the further refinement of the program, with implications that may extend beyond the specific national contexts in which the study was conducted.

Regarding the anchor instruction approach according to the perception of the in-service teachers, the findings suggest that case-based studies were widely recognized as motivating, relevant, encouraging, and useful, as reflected in the high overall rating, despite notable variation in perceptions related to distraction and time requirements. Generally, the training was evaluated as highly relevant for teachers' professional development, attaining consistently positive scores in terms of quality and overall utility, with a substantial proportion of participants indicating they would recommend it to others. While only minor differences emerged in the teachers' evaluations, aspects such as collaboration and feedback reveal areas that could benefit from further refinement, suggesting that the program is both effective and promising, yet still open to improvement and adaptable to a wide range of international educational contexts with similar institutional constraints in spite of the variation of the language used as a medium of instruction.

Beyond its immediate outcomes, this training program aligns with the principles of Education for Sustainable Development (ESD). By addressing affective, intercultural, and cognitive dimensions of language teaching, the modules not only equip teachers

with innovative tools but also promote values such as collaboration, empathy, and critical thinking, which are essential competences for building inclusive and sustainable societies worldwide. Thus, the project contributes to the broader goal of preparing educators who can actively support the Sustainable Development Goals (SDGs) through transformative teaching practices.

On the whole, the study confirmed both the viability and the relevance of the training. With the planned improvements, the program holds significant potential to strengthen teacher education and to foster sustainable, forward-looking educational practices, while also serving as a transferable model that could inform similar initiatives at an international level.

Acknowledgement

The project *SLS4Teens* is financed by Erasmus+ (2023-1-FR01-KA220-HED-000159458) and carried out by partners of the EUGREEN-alliance and beyond: Karina Becker, Laura Victoria Fielden Burns, Giulia Costa, Marie-Ange Dat, Julia María García Quirós, Delphine Guedat-Bittighofer, Carmen Hidalgo Varo Eva-Maria Klan, Cristina Manchado Nieto, Marco Mezzadri, Mariapaola Paita, Siling Sung.

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