

Fostering the Development and Implementation of Digital Learning Strategies for Digitization in Schools

Mariya Monova-Zheleva¹[0000-0001-8910-2502], Yanislav Zhelev¹[0000-0003-2783-5617],
Michela Tramonti²[0000-0003-0098-863X], Alden M. Dochshanov²[0000-0001-8265-8639]

¹ Institute of Mathematics and Informatics – Bulgarian Academy of Sciences, Sofia, Bulgaria
² EU-Track - European Training and Research Association for Key Cooperation to Business,
Terracina, Italy
mariya@zhelev.com, yanislav@zhelev.com, m.tramonti@eu-track.eu,
a.dochshanov@eu-track.eu

Abstract. In today's fast-paced and rapidly changing world, teachers must continually update their skills and competencies to meet the new requirements of education. As new technologies and teaching methodologies emerge, teachers need to stay abreast of these changes to be effective in the classroom. The paper discusses an approach for improvement of skills and competencies of the adult educators across Europe on how to use digital tools, digital content libraries and technology-enhanced methods, among them the “Episodes of Situated Learning”, to ensure engaging and meaningful virtual instruction in inclusive settings.

Keywords: Episodes of Situated Learning (ESL), Technology-enhanced Learning, Digital Skills, Digital Competences.

1 Introduction

With the rapid sociocultural changes and the expanding influence of digital media and digital libraries with cultural and scientific content, teaching is currently undergoing a redefined significance focused on transforming through advanced technology and automation.

On the other side, the pandemic drastically altered the landscape, forcing the proliferation and usage of digital resources, tools and approaches in work and life. Moreover, the expectations of students, parents, and society at large have evolved, making it crucial for teachers to keep up with the latest trends in digitization of the education.

Redesigning teaching and learning for the classroom requires professionalism, but online teaching adds complexity, demanding precise design and ongoing evaluation. Teachers can enhance their effectiveness, improve student outcomes, and remain relevant in the profession only by continuous professional development and improvement of their digital and pedagogical competencies.

In order to increase the quality and competitiveness of education provided by the schools, the European Union has launched various initiatives and funding schemes. As

a part of the efforts related to promoting digital skills for classes 2.0 development via provision of tailored training addressed to the school teachers from Bulgaria, Italy, Romania and Spain was started the project BoostClass 2.0 (BoostClass 2.0) supported under the Erasmus+ programme.

2 The Project Methodology

Within the framework of the project on the base of thorough research among EU schools and needs and gaps identification, an online course for flexible online self-directed training of secondary school teachers was designed and developed.

The course contents covered the following aspects: improving the skills of teachers in the use of digital libraries with cultural and scientific content as well as platforms and environments for e-learning and collaboration; utilizing the attractiveness of technology and gamification techniques to improve social inclusion focused, mainly on language skills improvement and responsible use of technology in terms of safety and ethical rules; development of competences for the effective application of combined pedagogical methodologies such as "Episodes of Situated Learning" through the appropriate use of digital approaches and tools.

The training was delivered to the teachers through e-platform designed for the purpose. The e-platform is optimized for mobile access and to function equally well on laptop, tablet or smartphone. The fundamental technologies behind the proposed solution are open-source and consist of PHP, the MySQL database, Apache web server, Moodle, etc. The proposed technology infrastructure is developed to accessibility compliance standards.

The modular and object-oriented design of the courseware and its associated services provide the flexibility to combine modules as needed and create new ones cost-effectively, especially in cases where customized extensions are required.

During the experimentation phase, the project team at the national level collected both qualitative and quantitative data from the target groups, teachers and students, to analyse the experiences realised.

The teachers participating in the online training compiled two questionnaires. The first is, Pre-Piloting Questionnaire for Teachers before starting the training on the online platform and then the second Post-Piloting Questionnaire for Teachers. The aim was to gather and compare relevant data to prepare final recommendations for those who intend to replicate the experience or transfer it to another sector. In addition, the participants delivered a Teachers' Report to describe the work realised with the students and to collect the strengths and weaknesses of the methodologies introduced by the project.

Also, the students had to compile an online questionnaire after the project activity implementation. These tools gave the project team relevant results about the methodology and tools used.

3 The Episodes of Situated Learning (ESL) Methodology

The episode of situated learning is a methodology based on a lesson plan combining a systematic and creative use of the tablet smartphone with the situated learning experiences in the classroom to foster meaningful learning experiences and inclusion (Rivoltella P. , 2017) (Terrenghi, et al., 2019) (Messina & Carenzio, 2022). For "episodes of situated learning" are meant "episodes", as minimal didactic units, which represent and constitute the fundamental part of the teachers' interventions. An episode of situated learning is an educational part from which teachers start and develop learning that brings together knowledge, attitudes and skills by making both teachers and students aware of this process (Rivoltella, et al., 2013).

Each ESL consists of three key elements:

Anticipatory moment: it is a real delivery (a video to watch, an experience to live, a document or a testimony to read) that is provided to the whole class (usually in flipped mode). At this stage, the teacher should be able to select appropriate information resources related to the subject and the topic from digital libraries with cultural/scientific content and integrate them into the learning scenario in a way that motivates and stimulates the learners and promotes recovery, reinforcement of prerequisites, focusing on the topic and becoming familiar with the vocabulary that will be used.

Operating moment: students carry out a micro-activity, whose duration must be between 25 and 30 minutes, individual or group, to realise a product (e.g., a page of comics, a conceptual map, a short video, a collage of information from digital libraries, etc.). At this stage, the teacher must find the right technological tools to achieve the previously set goal.

Restructuring moment: the debriefing, or reflection on activated processes, serves to fix the elements that provide a conceptual framework for the students' experiential work. It can be done through brainstorming or more structured analysis techniques, such as checklists, guide questions and conceptual maps. The teacher ends the ESL with a short frontal lesson summarising the key concepts, guiding the study and their further insights (Macchia & D'Ambrosio, 2018).

Therefore, the teachers begin the lesson by recalling the concepts on which they intend to make the whole class work; then, they create a frame, a virtual environment to delimit their teaching and educational action.

After a quick presentation of the topic, the teachers assign a task to be done before the actual lesson. It should be done individually at home and could consist of reading documents, watching a video, etc. Based on this preparatory work, the class is delivered a task that, usually, is a multimedia micro-activity or a digital artefact/deliverable. Some examples could be photographic documentation of a series of observations, the preparation of a video, the carrying out of a series of measurements, a digital billboard, and storytelling (Macchia & D'Ambrosio, 2018).

The lesson ends with a presentation, analysis, and discussion of these products. These activities allow the teacher to let the class reflect on the activity carried out (so-called phase debriefing), bringing the conclusions again to the initial conceptual framework.

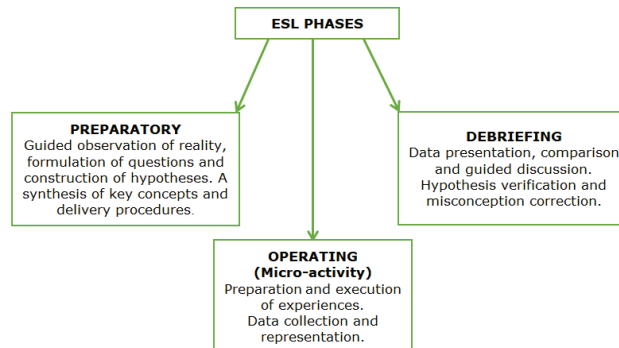


Fig. 1. The Episodes Situated Learning Methodology representation.

4 Results of the Experimentation Phase

The target groups involved in the piloting phase were teachers/educators/instructors in the adult sector and their students.

The teachers/educators/instructors were comprised of 73 people (26 from Italy, 15 from Spain, 16 from Bulgaria and 16 from Romania), of which 56,16% came from the school system, 34,25% from other educational services, 8,22% from vocational training services and 1,37% from “other sectors”. Most participants teach Electronics (17,81%), Technology/ICT (16,44%), Mathematics and Language (15,07%), and Foreign language (13,70%).

Regarding the students involved, the results show that 59.35% were less than 25 years old, and 11,79% of respondents were placed in the 30-39-year-old field. Regarding the learning environment, where the learners attend their everyday lessons or training, 65,45% of the respondents stated that school management supports integrating digital technology in the classroom. In fact, 59,76% have at least one interactive whiteboard in the school, compared to 21,53% who don't have such digital tools.

Most schools have a stable and fast internet connection, 73,98%, compared to 15,85% that don't.

Not all students can access networked digital devices at home (15,85%). However, they can use digital technologies in the classroom (60,16%), including devices such as laptops, tablets, and smartphones (70,73%).

The teachers' training was launched in December 2021 by organising webinars or face-to-face meetings to introduce the participants to the main features of the piloting phase: teachers' online training, the e-learning platform as the learning environment and the ELS methodology and its experimentation with the students.

After the training, the teachers tested the ESL methodology in the class.

4.1 Teachers' Results

The total number of registered participants in the online training course who completed all the modules available was 71, compared to the initial 73 (- 2 people). At the end of

the training, the participants filled in another online questionnaire and were asked to self-evaluate the digital competencies acquired thanks to the training.

The results show a significant improvement in all participants' digital competencies by raising their knowledge level. The level "Newcomers" (A1) increased by 0,12 points, while the level "Explorer" (A2) decreased by 32,5 points concerning the initial level of the participants. The initial percentage of the level "Integrators" (B1) increased by 6,62 points and the level "Experts" (B2) by 20,03 points.

In addition, the best result is demonstrated by the improvement of the level "Leader" (C1) and "Pioneers" (C2), which respectively have an increase of +5,77 and +2,86.

The second section of the questionnaire collected information about the utility of teaching activities gained through the knowledge acquired during the training.

Most participants (84,51%) found this knowledge very useful for their teaching practices, against 15,49% who remained neutral.

This data reveals a persisting difficulty in revising current teaching practices based on face-to-face modalities by integrating them with digital tools. Teachers and educators are still bound to traditional ways of assessing their students' performance, such as tests, interviews, and exercises.

Regarding assessing the students' learning, only 12,68% don't foresee using digital tools due to the students' low ICT skills or the institute/organisation setting. However, 87,32% of the respondents will integrate them systematically into their students' learning process.

In addition, the participants evaluated their general knowledge and competencies on the methodology proposed, episodes of situated learning. Some of them need more time to practice it to be sure to use them correctly with their students. However, it is considered more feasible to be adopted and applied in the classroom with adult students (59,15%), and 36,62% foresee some possibilities to use it.

4.2 Students' Results

The students' outcomes and work were managed mainly in groups (64,23%), while 35,77% of them preferred to work individually. In any case, for both working modalities (in groups or individually), the experience was considered interesting and motivating, mainly in performing research.

With an average of 79,88% of the students, the motivation and the experience were very positive and engaging. After the activity implementation, the students stated that the learning contents were more precise (75,20%), more concrete and practical than before (79,27%), more accessible (80,49%) and more involving (80,89%).

The proposed method allowed the learners to use their creativity and originality (73,17%). Therefore, studying and learning new concepts (82,52%) is considered motivating, and technology can help increase interest in the topics studied. However, only 19,92% found this method uncomfortable due to the need for extra time to realise the outcomes.

5 Conclusions

By utilizing digital tools and approaches in the Episodes of Situated Learning methodology, teachers can create a more interactive and engaging learning experience for their students. This can lead to increased student motivation, participation, and achievement. Additionally, digital tools and approaches can also help teachers personalize instruction, differentiate learning, and provide timely and targeted feedback.

Overall, the integration of digital tools and approaches in the ESL has the potential to revolutionize the way teachers teach and students learn. By empowering teachers with the necessary competencies and support, we can create a more dynamic and engaging learning environment that prepares students for success in the digital age.

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