

Leveraging meaningful learning for technology-enhanced language instruction

Eleni Korosidou¹, Tharrenos Bratitsis²

ekorosidou@uowm.gr, bratitsis@uowm.gr

¹ Department of Primary Education, University of Western Macedonia

² Department of Early Childhood Education, University of Western Macedonia

Abstract

Meaningful learning is a process realized to provide gaining in-depth knowledge by associating existing with new knowledge. In the light of meaningful learning, incorporating a number of features into the learning environment, such as active learning or collaborative learning, engaging in meaningful discussions and activities as well as providing opportunities for reflection are of pivotal importance. In this current study, researchers aimed at developing a context of meaningful learning by employing the principles governing the Reference Framework of Competencies for a Democratic Culture (www.coe.int/rfcdc) and by extension, the pedagogical principles of the Digital Destiny program (<https://www.digitaldestiny.eu/>), during the implementation of a pilot program in primary education. A number of activities were designed which aimed to boost language learning in a technology-enhanced environment through: 1) societal issues, 2) interaction, 3) design thinking, 4) participation in meaning-making processes, 5) reflection and evaluation. Special focus was placed on the development of participants' writing skills. The results of the study draw on data collected from pre- and post-test and the teacher/ researcher's journal. It is indicated that the pilot intervention had a significant impact on young learners' writing performance, while their critical and thinking strategies were enhanced through interaction and dialogue on societal issues.

Keywords: Meaningful learning, digital technologies, language learning, societal issues, young learners

Introduction

Modern learning environments are expected to be interactive and innovative learning spaces, not only limited to education, but addressing the development of the individual as a whole. In other words, in the modern school context, learners should be prepared for their smooth integration into society by engaging in learning activities that allow them to develop skills to meet future challenges. Therefore, it is an educational priority to strengthen skills that will allow today's students to adopt the role of active citizens in the future.

Meaningful learning is a process realized to provide gaining in-depth knowledge by associating existing and new knowledge. This means that learners need to feel the relevance of the knowledge and skills offered at school. Relevance becomes clear when learners are encouraged to make the transfer of the things they learn at school to future contexts, therefore applying already acquired knowledge to new situations. Transfer of knowledge indicates meaningful learning (Mayer, 2001, 2002; Haskell, 2001). The key idea in meaningful learning is that the learner gradually integrates new pieces of knowledge within existing pathways in his/her own cognitive structure (Mintzes et al., 2005). In this context, the teacher plays an important role in setting the stage for the learners to make those connections. In more detail, educators who opt at offering meaningful educational experiences to their students should design their teaching by creating cognitive procedures, where learners a) actively participate, b) continuously interpret and construct their own meaning, while c) realistic context as well as d) peer collaboration in a natural environment are primary (Howland et al., 2011). Various methodologies and approaches exist for the teacher to scaffold meaning making and thus transfer, with meaningful learning design primarily depending on linking theory and practice with strong experiences where

both teachers and students feel free to express their positive or negative emotions (Kostiainen, 2019). It is also worth mentioning that previous research in the field (Andrews et al., 2023) indicates that although students believe meaningful learning is most likely during in-person workshops or sessions that focus on applying knowledge in practice, they view inadequate opportunities to check their understanding in an authentic context, feeling they lack engagement or challenge. They also state their difficulty in interacting with peers and educators in a meaningful learning context (Andrews et al., 2023).

Taking the above-mentioned into consideration, this current study aspires to create opportunities for through knowledge application, problem solving, and interaction with peers and educators in a meaningful learning context. Following this idea, a theoretical framework was designed within the Digital Destiny project for Education in Sustainable Development (ESD). The main axes of the framework were i) the Competence Framework for Democratic Culture (CDC), and ii) contemporary, student-centred educational methodologies. The core concept of the approach introduced was the notion of social issues. For the purposes of this study, the pedagogical framework of the Digital Destiny project and the proposed teaching methods were utilized.

The paper is structured as follows; initially the theoretical framework is very briefly presented. Then, the research design of the study is explained, followed by the results and the concluding discussion.

Theoretical Framework

As mentioned in the introduction, this study was founded on the pedagogical framework of the Digital Destiny project. To develop it, the consortium relied on various approaches, apparent in the literature such as: the UN 2030 Agenda and the sustainable development goals, UNESCO's proposals on ESD and Global Citizenship Education, the CDC framework by the European Union, and OECD's Learning Compass for Education 2030. Many competences are mentioned in these frameworks and approaches. To exemplify, UNESCO (2017) highlights systems thinking competency, anticipatory competency, normative competency, strategic competency, collaboration competency, critical thinking competency, self-awareness competency, and integrated problem-solving competency.

Reflecting on this competency list, UNESCO (2017) claims that individuals must gain knowledge in understanding the complexities, uncertainties, trade-offs and risks related to global and local sustainability challenges. The key word in this case is complexity, which is also often mentioned in most of the aforementioned approaches and frameworks. Giangrande et al. (2019), studying ESD frameworks, propose the inclusion of competences that refer to "intrapersonal transformation" and a connection to the notion of multiple intelligences. Furthermore, they highlight the connection between competence and action. The key questions are how acquired competences are actually used and how they are activated in practice. They conclude that while developing critical systemic thinking is essential, more elements are necessary to ensure a transfer to action. These elements include acknowledgement and commitment to values, certain attitudes, and motivational drivers. Among the favouring elements that Giangrande et al. (2019) propose are the use of appropriate pedagogical approaches and methods, that support learners to understand their underlying values and motivations and to make connections with societal issues.

Societal issues are authentic, collective matters of concern in society. They concern society often in a negative way because they entail complex environmental, social, and economic consequences for society. Societal issues provide an interesting context for developing competences, in an active, conscious way, in collaboration with others. At the same time, learners are given the opportunity to review and renew the world from the safe training ground that schools can provide (Van Poeck & Östman 2020) as well as to experience that they themselves can be shapers of society.

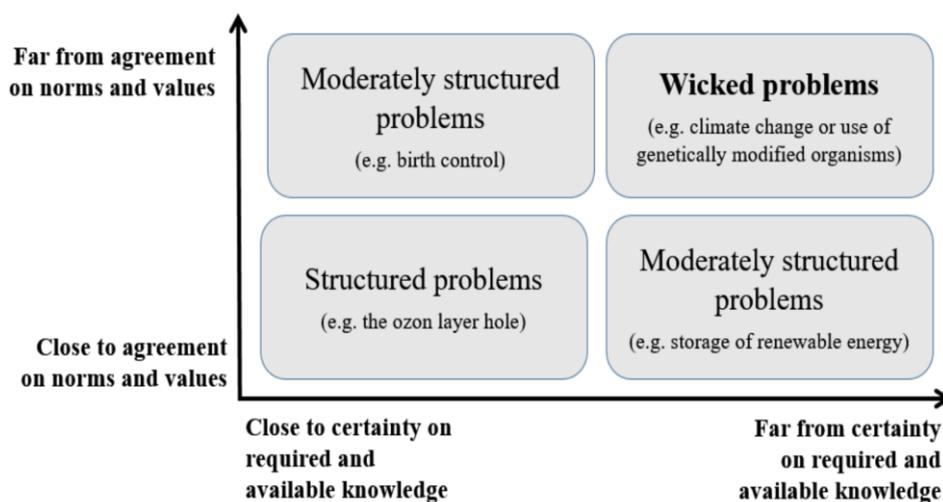


Figure 1. Factors connected to complexity of societal issues

Societal issues present complex and problematic situations. They trigger the feeling that we do not have the right knowledge or skills, while to provide an answer to certain issues demands that we make a move, by thinking or acting, or both at the same time. Societal issues may include social, economic and ecological dimensions. Depending on the approach adopted concerning a specific issue, not every dimension is taken into account. Societal issues can greatly vary in complexity. This complexity depends on two factors (Block, Van Poeck & Östman 2019):

- The general consensus on scientific evidence (X-axis)
- The general consensus on underlying norms and values (Y-axis)

As presented in Figure 1, the less consensus there is about the scientific basis or about the underlying norms and values, the more complex the societal issue becomes.

An environment in which context is provided through a societal issue, offers opportunities for learning: children learn by going through thinking processes, then through actual action, and finally by reflecting on both. This alternate thinking/doing and reflecting should lead to achievement of objectives - via new knowledge, skills, change in attitude, re-evaluation of values, or insights, an opinion, different possibilities, an analysis, or via more and/ or further ways. It is a process in which learners enter into relationships with the world around them. They learn by relating to what comes to their way in the social, physical, or emotional world, as through the process they give meaning to it (Taguchi 2007; Östman, Van Poeck & Öhman 2019). Researchers underline that meaningful learning is linked with teaching methods such as inquiry and problem solving, targeting at an individual's ability to identify and analyze underlying structures as well as connect existing with new concepts (Jonassen, 2003; Mystakidis et al., 2019). Meaningful learning also requires a realistic context and learners' engagement in activities linked to authentic or simulated experiences, with the ultimate aim of becoming personally significant and transferable (Mystakidis, 2021).

Previous research sets out the key principles of meaningful learning in the classroom, as follows (Valori, 2014):

- Tasks carried out in the classroom enable all learners to learn.
- Motivation contributes to creating an improved classroom environment, allowing for task engagement on the part of the learners.
- Means are related to the learning environment.
- Creativity strengthens imagination and intelligence.
- Concept mapping facilitates linking and connecting concepts.
- Educational curricula are adapted considering learners' needs.

In light of the above, researchers aimed at facilitating and enriching this learning approach, by applying the pedagogical framework of the Digital Destiny project, mainly relying on the following 5 principles:

- Principle 1: Stimulate learning through societal issues
- Principle 2: Stimulate learning through interaction
- Principle 3: Stimulate learning through thinking
- Principle 4: Stimulate Learning through reflection & evaluation
- Principle 5: Stimulate learning through structured processes

A very detailed documentation of this framework is available at the project's website (<https://www.digitaldestiny.eu/>). It is out of the scope of this paper to present the framework in detail; many working methods were created, based on the above-mentioned principles, some of which have been used in this study. Although they were initially designed for ESD, in this study they are utilized for language instruction, highlighting that societal issues and the complexity that characterizes them is the focal point of the framework introduced.

Research study

Aim and research questions

The pilot program introduced aimed at strengthening young learners' writing skills in the target language (English) by providing them with ample opportunities to engage in activities connected to societal issues. A great number of social consciousness-raising activities were realized in a technology-enhanced environment, aspiring to identify the possible effect of digital technologies on participants' skills and strategies. It needs to be mentioned that one of the researchers was also the language teacher, who was well aware of the participants' learning needs. Therefore, focus was placed on writing skills, as most students were facing difficulties in writing in the target language. The research questions posed were the following:

- Can the development of a context of meaningful learning contribute to the enhancement of foreign language writing skills?
- How can digital tools support the development of learners' skills and strategies?

Participants

The research was conducted with 26 participating students (10 boys, 16 girls), attending the 4th and 5th grade in a primary school in a semi-urban area in the educational region of Western Macedonia. The young learners participated in the program during learning English as a foreign language for a 3-month period, while 45 teaching hours were spent for the realization of the pilot program. Their language competence level according to CEFR (Common European Framework for Languages, 2020) was A1+/ A2-.

Designing the syllabus and implementing the pilot program

As mentioned above, developing a context of meaningful learning constitutes in designing a learning framework that encourages the development of skills on the part of the students, so to act as socially conscious citizens in the future. The pedagogical principles adopted for both designing the syllabus and implementing the present pilot program were primarily centred in understanding, describing and defining the environment of meaningful learning. The implementation of the program's activities was oriented towards the development of knowledge, skills and attitudes and young learners' ability to address social problems by offering "educational solutions" to social problems (Biesta, 2006, Säfström, 2011, Todd & Säfström, 2008). Hence, in the syllabus designed within the Digital Destiny project (Erasmus+ Project no. 2020-1-IS01-KA226-SCH-082804, <https://digitaldestiny.eu/>), societal issues were perceived as interesting driving forces for creative and critical research, offering new ways for

today's students to learn how to function as tomorrow's citizens. In that vein, the *Digital Destiny* framework was adopted (<https://www.digitaldestiny.eu/>). Syllabus design focused on the following five principles, as mentioned in the previous section, specifically:

- A. Learning through societal issues, facilitating primary school students to connect with relevant issues in their immediate environment.
- B. Learning through interaction, encouraging primary school students to participate in discussions and interact in a meaningful context.
- C. Learning through thinking, offering experiences for designing and adopting effective strategies.
- D. Learning through meaningful learning, offering opportunities for participation in meaning-making processes.
- E. Learning through reflection and evaluation, facilitating the evaluation of the pedagogical delivery of the proposed framework.

Implementation of the pilot program comprised five stages, the focal point of each was placed on the principles presented above. The development of a number of thematic axes aimed at stimulating interactions between a learner's perspective and his/ her classmates' perspectives. The primary aim was to create a technology-enhanced learning environment which promoted and encouraged respectful expression of information and opinions, also enabling participants to reduce prejudice and promote empathy. The thematic axes/ modules processed were the following: 1) Exploring diversity in our immediate environment, 2) Approaching the 'different', 3) Interpreting and analysing diversity, and 4) Creating one's own stories about diversity. A reflection module followed, encouraging learners and the teacher to examine strengths and identify areas for improvement. All through the pilot intervention, young learners were working a) in class, b) in the school's lab and c) at home, improving the provision of digital skills by employing digital methodologies, tools and content during instruction and learning. Following on, the stages of the pilot implementation are thoroughly described.

Stage 1

In the first stage, emphasis was placed on learning through societal issues. Young learners were asked to think about a societal challenge or an issue that they observed in their environment, considering their classmates as well as their friends and families. Teacher also stimulated young learners by allowing them to choose from several locally relevant societal issues, providing them with a number of pictures or links presented on the news. The Think-Pair-Share technique was used, with learners being asked to think of one societal issue among the ones presented, report it on a virtual sticky note and put that note on a virtual board. To that purpose, Miro (Table 1), a digital whiteboard platform for mind mapping and working together on a topic, was used. Teacher shared the link of the Miro board with learners, encouraging them to work together on the digital whiteboard. In more detail, young learners created notes, post-its and comments. After sharing their thoughts and views on the whiteboard and listening to their classmate(s) talking about societal issues, they engaged in a reflective process, recognizing the additional societal issues and their complexity. Following on, the digital tool employed was Mentimeter (Table 1), encouraging student participation by gathering input through open questions, polls and word clouds. Through this process, greater emphasis was placed on the topic of 'Diversity', due to young learners' personal experiences of diversity (disability, appearance, socioeconomic background).

Stage 2

Aspiring to increase learners' motivation to think critically and engage in problem solving and experimentation, the teacher/ researcher used personal experiences in the societal issue of 'Diversity' so as to provoke emotional attachment. In other words, young learners were asked to report their feelings to issues of diversity, drawing on their personal stories or on pictures of a story they were

asked to look at (Figure 2). Pluralism was stressed, by inviting different opinions, bringing in conflicting visions and provoking emotional attachment. A pictictionary game was also realized, with learners engaging in reflection drawing in an online environment, depicting relevant vocabulary using digital pens and colours (Figure 3). In this case, the digital tool employed was Skribbli.io (Table 1), a free multiplayer drawing and guessing game. In every round of the game learners should draw their chosen word and others were invited to guess it to gain points. A private online room was created for the participating students by the teacher, who provided them with a personal link and custom words.

A number of dilemma statements were also presented to the learners in order to engage in a debate, where they formed groups to support their arguments to their classmates. The learning environment created allowed for everyone to grow and change in relation to their learning. Interaction and exchange of views was enhanced by drawing on digital narratives about diversity (indicatively mentioned: *FLOURISH*, an animated short film by Or Gal, *Elmer, the patchwork elephant* by David McKee). Young learners were experiencing different working methods, as 'Another world' or 'Hoop in'. In 'Another World' they were invited to conduct collaborative research and communicate so as to reflect on real world problems, changing their previous ideas and employing critical thinking.

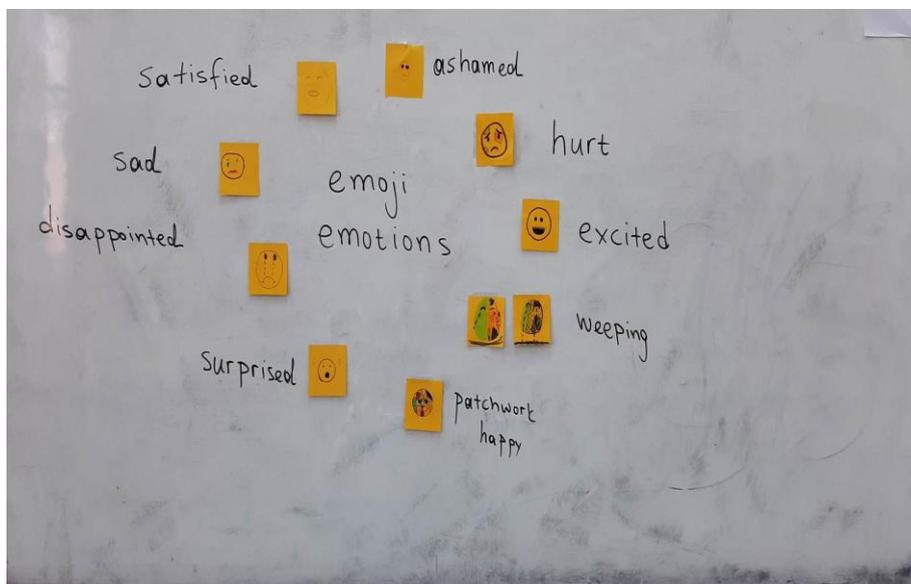


Figure 2. 'Spinning wheel' to report feelings to issues of diversity.

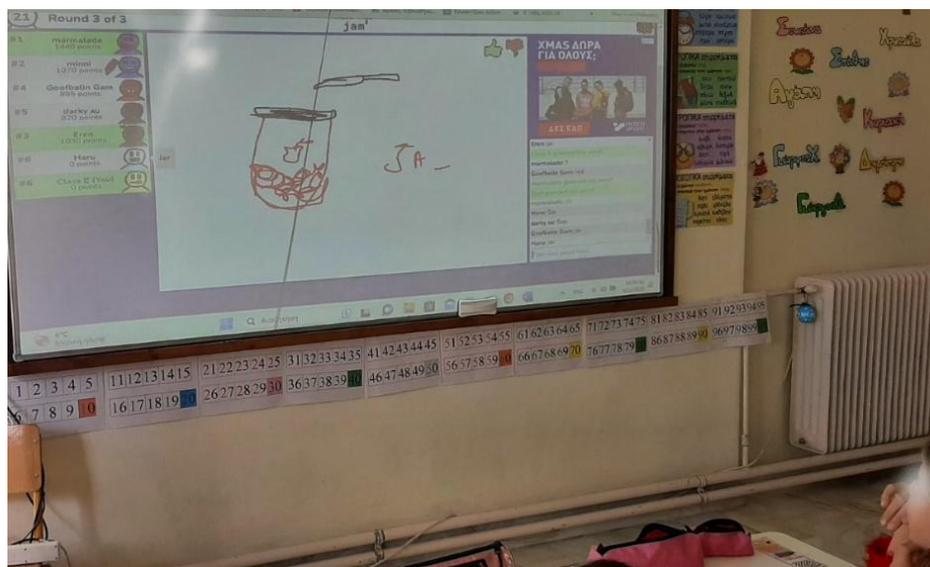


Figure 3. Online pictictionary game.



Figure 4. 'Hoop in' to explore diversity concepts.

Both digital and experiential tools that stimulate interaction and dialogue were used (Table 1) at this stage. In more detail, in order to express and exchange ideas they used the 'Padlet' digital tool. The teacher posed a certain question on Padlet wall, while young learners discovered the answers or more questions while conducting research, which they posted under each driving question. In 'Hoop in' participating students were asked to fill in 'hoops' with diversity concepts that were contrasting or similar, or those which were ambiguous or obscure (Figure 4). The concepts to be identified and reviewed were taken from the story scenes of a digital narrative (*Elmer, the patchwork elephant* by David McKee).

Stage 3

The teacher stimulated primary school students' thinking processes, by inviting them to respond to a number of questions, so as a) to explore ideas, responding to 'What could happen if...?', b) to specify ideas, responding to 'Why do you think this is so?', c) to broaden an idea, responding to 'What else could happen?', d) to compose hypotheses, responding to 'How could it end up there?', and e) to visualise their thoughts and ideas by thinking together. Visualizing thinking about societal issues actually enabled learners to use language, both spoken and written, to ask questions purposefully, to reflect upon the thinking strategies applied, to give and take feedback, to paraphrase and document their ideas as well these of their classmates. Teacher's role all though this stage was to stimulate thinking processes and engage learners in a reflection process.

Furthermore, in the context of a digital narrative and focusing on the 'diversity' issue, learners at this stage were invited to brainstorm, predict story content, sequence ideas or events presented in the story, clarify views or opinions, elaborate criteria for their interpretations, make connections, compare and imagine what could happen in other contexts. Therefore, as previously mentioned, young learners were challenged to participate in thinking processes, by reflecting on the thinking steps they took and by writing the steps they followed on a digital sticky note on the Miro whiteboard (Table 1), so as to immediately share them with their classmates.

Stage 4

At this stage, student-centred processes were followed, having learners working in groups, solving open-ended problems as well as following design thinking steps, namely: empathize, define, ideate, prototype and test, so as to reach solutions. Interaction among participating students was enhanced

by using printed and digital tools to motivate and facilitate them to think about the content of the story. In more detail, empathy maps were created by learners (Figure 5) while problem trees (Figure 6) were also employed as a three-step methodology, inciting the identification of main problems presented in the story, along with the identification and evaluation of causes and effects for the story's completion.

Young learners were also provided with a problem statement regarding a situation presented in the digital narrative they were processing. They were asked to consider the situation, empathize with a story character and understand his/ her "pain" or, in other words, the challenge the character was facing (Figure 5). They worked collaboratively, following a project-based process to define the problem, drawing on the problem statement. During their work, learners were motivated to understand a problem situation better through research and interaction, responding to the question 'What would happen if the story character could (not)...?', considering various scenarios through their

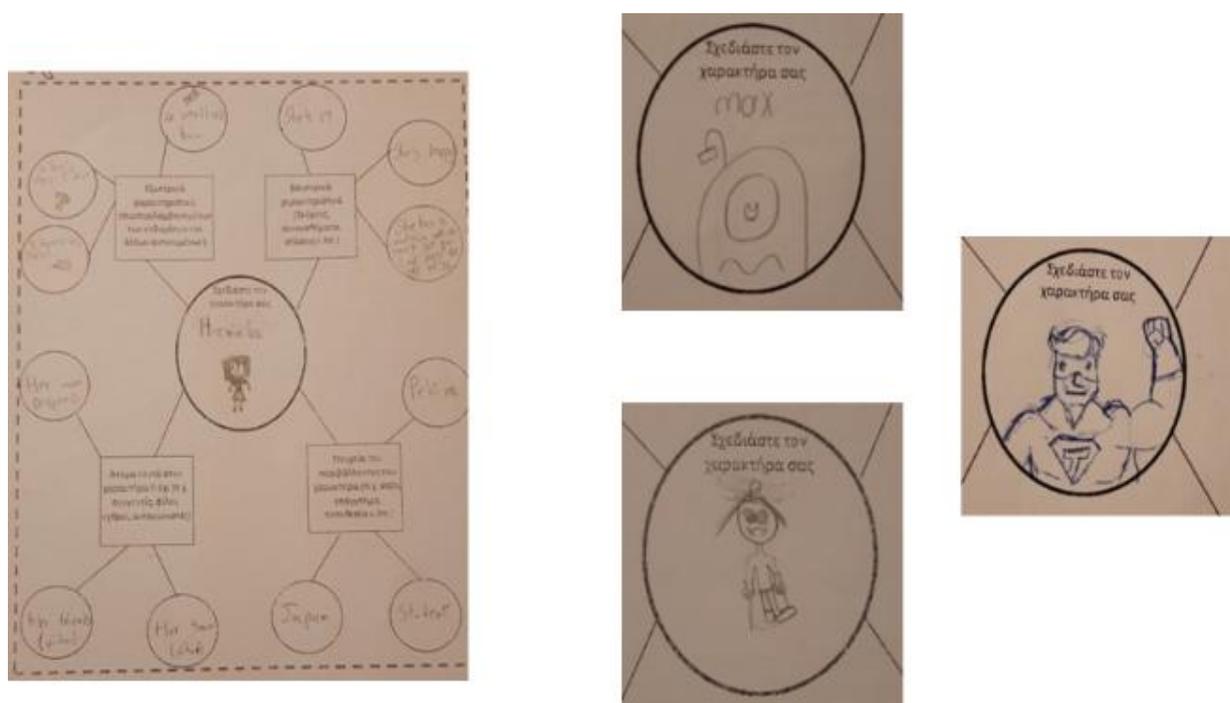


Figure 5. Empathy maps created by young learners.

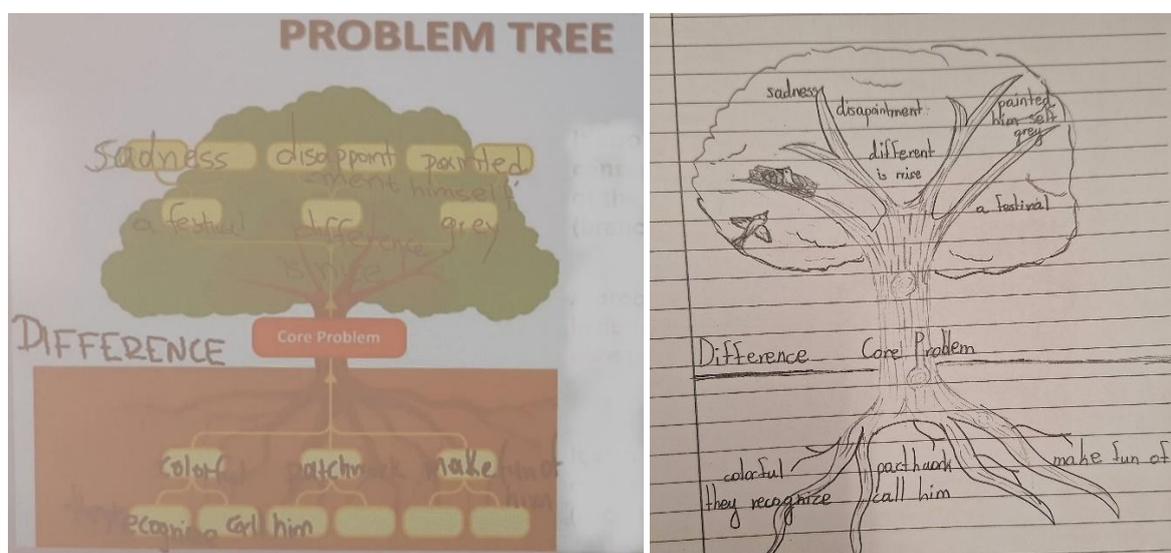


Figure 6. Drawing on a story's content to create a (digital) problem-tree.



Figure 7. Digital stories created by learners after adding a ‘distraction’ element to the story’s content.

interaction with their group. Groups were actually given a ‘disruption element’ presenting them with a new factor, an obstacle or a problem that the story’s character needs to consider. After working on the problem, learners shared their newly-composed stories with their classmates, presenting their work in class and being given opportunities for reflection (Figure 7).

The stage concluded with the creation of an original digital narrative by the participating students themselves. Young learners composed their storyboards (Appendix A) and rewrote the stories previously narrated adding or reflecting on new details and issues. They presented their stories through videos or graphic novel in a digital environment (Table 1). The new stories were focused on diversity, with learners either adding a new character to the given story or a personal experience, or even by approaching it from another perspective.

Stage 5

In this stage, a process of thinking about how young learners performed was realized, reflecting upon the learning processes followed and the thinking strategies employed. The teacher motivated learners to ask themselves and/ or their classmates a number of questions in order to identify how they could improve, as well as to obtain feedback. Discussions and questionnaires were used, while digital tools were employed (Table 1). Questions discussed include the following:

- How well did you collaborate with classmates?
- Did you like the resources, equipment and materials used? Which of them was/ were most helpful for you?
- Did you like working in a digital environment? Why (not)?
- What did you learn that was new?
- Can you think of any difficulties that you faced?

Table 1. The mini-syllabus designed

Principles	Teaching Methods, Strategies and Techniques	Digital Tools
1. Learning through societal issues	Direct Teaching	Mentimeter
	Think-Pair-Share	https://www.mentimeter.com
	Discussion	Miro https://miro.com
2. Learning through interaction	Debate	Spinning Wheel
	Inquiry	https://www.randomspinwheel.com
	Discussion	Skribbl.io https://skribbl.io
	Reflective drawing	Padlet https://padlet.com
3. Learning through thinking	Experiment	
	Research	Mentimeter
	Discussion	https://www.mentimeter.com
	Inquiry	Miro https://miro.com
	Reflective writing	Kahoot https://kahoot.it
4. Learning through meaningful learning	Design Thinking	Storyboardthat
	Project-based learning	https://www.storyboardthat.com
	(Digital) Storytelling	Plotagon
	Class dialogue	https://www.plotagon.com
5. Learning through reflection and evaluation	Class dialogue	Mentimeter
	Reflective writing	https://www.mentimeter.com
		Miro https://miro.com

Research tools

To examine the effects of the intervention, this current study employed two instruments: a) pre- and post-test to assess young learners' writing skills in English as a foreign language, and b) a teacher/researcher's journal to assess their skills and strategies development during the learning process.

A pre-test and post-test model was employed with pre- and post-intervention measurements to assess the participating students' writing skills. The pre-test was distributed before the pilot implementation, while the post-test at the end of it. Pre-test and post-test included writing short narratives or creating storyboards on a given topic (Appendix A). The writing products were collected in learners' portfolios. The writing tasks were designed by the researchers according to A1/A2 CEFR can-do statements for writing. Each student completed the task on his/ her own before and after the pilot intervention. The researchers also considered the elements defining communication competence proposed by Canale and Swain (1980), namely: 1) Grammatical Competence, focusing on the grammar, syntax and vocabulary in the target language, 2) Discourse Competence, concerning cohesion and coherence in written discourse, 3) Strategic Competence, referring to the appropriate use of communicative strategies, and 4) Critical Framing, regarding the interpretation of a social and cultural context in which the story was produced. In assessing students' writing products both before and after the intervention, the students' writing scores were assessed by adapting the writing rubric (Table 2) suggested by Brown

(2007). Data for all variables were processed in the IBM SPSS v.26 program. The non-parametric Wilcoxon test was chosen since the data did not follow a normal distribution (Keller, 1987).

The teacher/ researcher completed a journal, engaging in a reflective practice in a two-week basis. The journal was structured on the basis of the reflection questions to guide journal entries proposed by Richards & Lockhart (1996).

Table 2. Writing Rubric (Brown, 2007)

Aspect	Score	Performance	Weight
CONTENT (C) 30%	4	The topic is complete and clear, and the details are relating to the topic.	3x
	3	The topic is complete and clear, but the details are almost relating to the topic.	
	2	The topic is complete and clear, but the details are not relating to the topic.	
	1	The topic is not clear, and the details are not relating to the topic.	
ORGANIZATION (O) 20%	4	Identification is complete and descriptions are arranged with proper connectives.	2x
	3	Identification is almost complete and descriptions are arranged with almost proper connectives.	
	2	Identification is not complete and descriptions are arranged with few misuses of connectives.	
	1	Identification is not complete and descriptions are arranged with misuse of connectives.	
GRAMMAR (G) 20%	4	Very few grammatical or agreement inaccuracies.	2x
	3	Few grammatical or agreement inaccuracies but no affect on meaning.	
	2	Numerous grammatical or agreement inaccuracies.	
	1	Frequent grammatical or agreement inaccuracies.	
VOCABULARY (V) 15%	4	Effective choice of words and word forms.	1.5x
	3	Few cases of vocabulary or word forms misuse, but no change in meaning.	
	2	Limited range of confusing words and/ or word forms.	
	1	Very poor knowledge of words and/or word forms which are not understandable.	
CONTENT (C) 30%	4	Correct spelling, punctuation and capitalization.	1.5x
	3	Occasional errors of spelling, punctuation and capitalization.	
	2	Frequent spelling, punctuation and capitalization errors.	
	1	Dominated by errors in spelling, punctuation and capitalization.	

Results

Pre- and post-test

Scores were assigned as follows: a 4-point score was assigned for 'Excellent' performance, a 3-point score for 'Good' performance, a 2-point score for 'Fair' performance, while a 1-point score was assigned for 'Poor' performance. Scores were calculated as follows: $\text{score} = 3C + 2O + 2G + 1,5V + 1,5M / 40 \times 100$. Wilcoxon Signed Ranks Test indicated that post-test ranks were statistically significantly higher than pre-test-ranks $Z = -3.930$, $p < .000$. Therefore, initial processing of the pre-test and post-test data revealed statistically significant differences regarding participants' writing performance (Table 3), demonstrating the positive effect of the intervention on young learners' writing skills in the target language.

Teacher/ researcher's journal

The qualitative analysis of the journal records led the researchers to the creation of three typologies, namely a) Teaching process, b) Young Learners' attitudes, c) Overall evaluation of the intervention, and several categories and subcategories under each typology (Table 4.) The teacher kept 6 journal records during the pilot intervention, while the frequencies that stemmed from the qualitative analysis of the journal data are reported in Table 4.

Table 3. The mini-syllabus designed

Participants	Mean	Z	P
Pre-test (N=26)	53.75	-3.930	.000
Post-test (N=26)	62.5		

Table 4. The typologies, categories and subcategories that stemmed from the analysis of the journal data

Typologies	Categories	Subcategories	Frequencies			
Teaching process	Goals	i. social consciousness development	6			
		ii. digital literacy development	5			
		iii. collaborative skills development	5			
		iv. writing skills development	6			
		v. brainstorming	3			
	Methods and techniques employed		vi. collaborative learning	6		
			vii. game-based learning	4		
			viii. Think-pair-share	2		
			ix. project-based language learning	4		
			x. design thinking process	3		
			xi. debate	2		
			xii. discussion	5		
			xiii. storytelling	3		
			Teaching aids		xiv. digital materials	6
					xv. print materials	5
					xvi. digital games	3
			Working online		xvii. pair work	6
					xviii. group work	4
					xix. working individually	3

Young learners' attitudes	Students' attitude toward the project	xx. learning as a pleasurable experience	6
		xxi. collaboration	5
		xxii. active participation	6
		xxiii. interest for societal issues	6
Overall evaluation	Assessment Methods	xxiv. digital skills development	6
		xxv. digital quizzes	1
		xxvi. writing prompts	6
		xxvii. drawing prompts	3
	Learning Outcome	xxviii. portfolio	3
		xxix. mindmaps/ visible thinking	2
		xxx. writing skills development	6
		xxxi. creating multimodal texts	2
		xxxii. digital literacy	5
	Development of attitudes	xxxiii. social consciousness enhancement	6
		xxxiv. critical literacy	4
		xxxv. cooperation	6
		xxxvi. taking responsibility for learning	6
		xxxvii. citizenship	5
		xxxviii. metacognition	4

The qualitative analysis results show the effect of the emphasis placed on dialogue and interaction regarding societal issues for the development of social consciousness and the enhancement of skills in aspects of citizenship. The blended learning environment encouraged the development of digital skills, by motivating learners to experiment with digital tools which stimulated interaction and dialogue in class. As the data gathered from the journal entries show, project-based language learning, design thinking process and storytelling comprised the driving forces of the learning framework created. Both the teacher/ researcher and the young learners facilitated sharing of views and ideas in the (digital) learning environment, allowing for the development of writing skills and also of pluralism during the learning process. Societal issues brought into the classroom incited the exploration and interpretation of ideas, enabling young learners to employ thinking strategies in order to a) add information (objects, ideas, different perspectives/experiences), b) judge or reorient their perspectives, by questioning to change the initial focus on specific aspects, c) conclude general findings and make decisions. Furthermore, respecting each other's ideas, listening carefully and giving proof of listening, inviting classmates to contribute by asking questions, clarifying, summarizing, challenging and building upon each other's ideas facilitated the development of writing, collaborative and metacognitive skills.

Conclusions

In this study, young learners' experiences were enhanced by digital technologies, in a context created by drawing on the principles of meaningful learning. The findings of the study show the positive impact of a context of meaningful learning on young learners' writing skills in the foreign language learning context. Collaborative and social skills also seem to be enhanced in a context of interactive experiences, where young learners are provided with opportunities to engage in discussions on societal issues evident in their immediate environment. What is more, project-based language learning and design thinking processes employed are found to foster writing, citizenship and critical thinking skills development. Therefore, researchers conclude that writing skills were enhanced in a context socially and culturally relevant to students' experiences as well as digitally augmented. In more detail, the processing of the quantitative data obtained from the pre- and post-test, reveal the positive

effect of the meaningful learning environment created in young learners' writing skills in terms of content, organization, grammar, vocabulary and mechanics. The processing of the qualitative data processed, as reported in the teacher/ researcher's journal, also show that when language, culture and community are inextricably connected in a socially-oriented language learning framework, language skills as well as citizenship and social consciousness are enhanced.

It is also found that teaching practices that encourage young learners to visualize thinking about societal issues enable them to engage in language learning, to ask questions purposefully, to reflect upon their thinking and enhance their metacognitive competence. Therefore, thinking dispositions are developed, making 'thinking' common, by helping students to formulate their thoughts, to elaborate on ideas of others and succeed in deeper understanding while writing their own texts. The findings of the study are in agreement with previous research supporting that emphasis should be placed on a) developing learners' critical thinking and their critical attitude towards the ways that society influences people's views, as well as the ways people's views influence society, and b) the role learners play in society as active individuals and language users (Dede, 2009). The results of this current study are also in agreement with studies highlighting that the creation of a gamified language learning environment (Korosidou & Bratitsis, 2020), where digital storytelling (Korosidou & Bratitsis, 2023) and project-based language learning are adopted, is shown to foster critical thinking through impactful experiences. This framework allows for the realization of the ultimate goal of language teaching, i.e. raising language and critical thinking skills alike (Socciarelli et al., 2020). Shrum and Glisan (2010) also suggest engaging students with social justice themes underlining the importance of a constructivist approach, in which learners are able to develop their own views about cultures and communities "through social interaction and interpersonal communication" (Shrum & Glisan, 2010, p. 156). In line with the present study, Shrum and Glisan (2010) state that such an approach allows for the creation of a student-centred framework, where students confront with authentic problems and topics. In such a context of meaningful learning, the role of the teacher is that of a mediator who fosters a community in which students are able to share opinions, to solve problems, to reflect on solutions and develop thinking strategies (Shrum & Glisan, 2010; Wright, 2000), as highlighted in the present study. However, comparing this current study with a number of relevant studies in the field, leads us to the assumption that designing a meaningful learning context should also aim at the examination of higher-order competencies acquired. Scholars suggest that evaluation strategies should include alternative assessment processes, where learners perform authentic, realistic tasks and engage in self-evaluation and peer assessment (Nieminen et al., 2019). Alternative assessment methods, including e-portfolios, concept maps and problem-based learning, can also encourage meaningful learning approaches (Rourke & Kanuka, 2009).

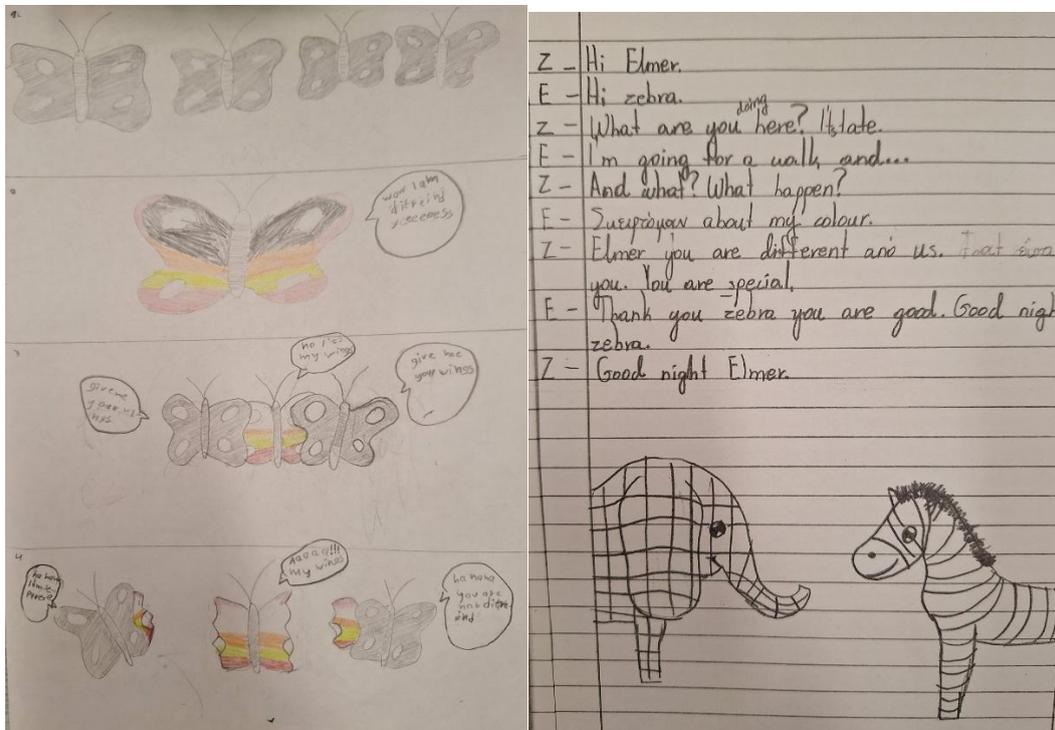
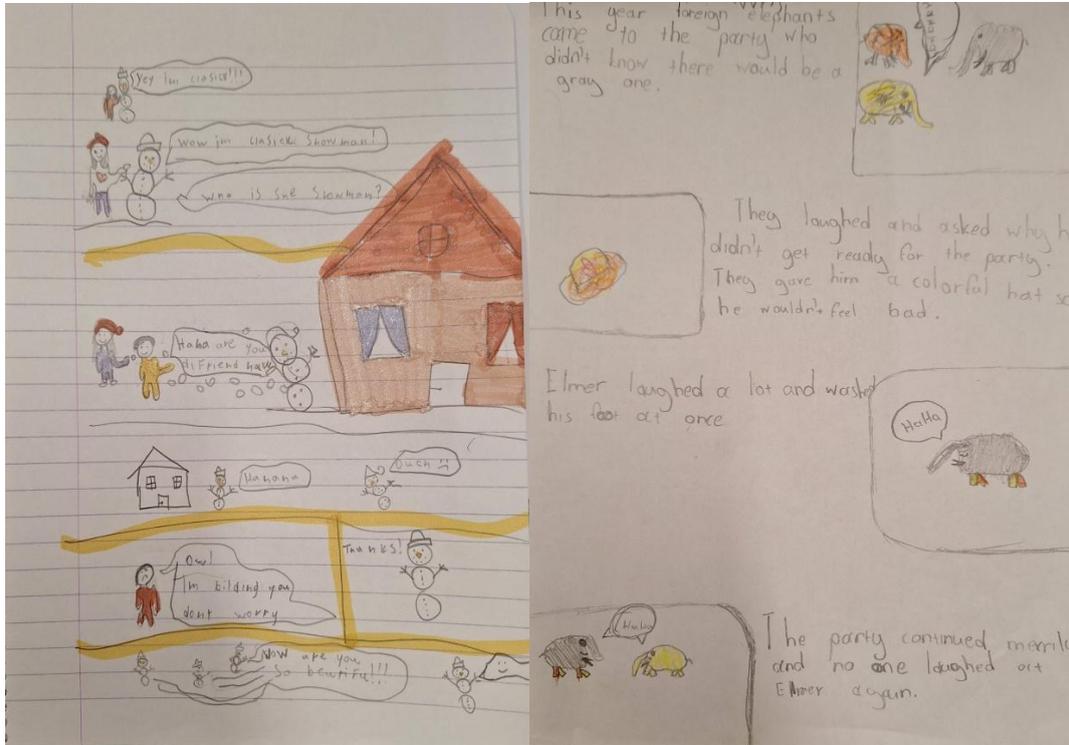
All in all, the pilot intervention presented with the methods, techniques and digital tools proposed cannot lead to the drawing of generalized conclusions. Limitations of the study include a rather small and convenience sample being engaged in meaningful learning for a limited teaching period. However, the observations and conclusions drawn give a very positive first impression, as it appears that the suggested syllabus and the teaching approach employed stimulate the development of language skills as well as of thinking processes. The notion of meaningful learning seems to present increased dynamics and further research with similar approaches may further highlight ways of incorporating its principles into everyday teaching practices. In this vein, implications of the study for educators and policymakers include carrying out teacher seminars, focusing on empowering them to acquire the principles of meaningful learning and apply them in the classroom. Employing alternative assessment tools for the evaluation of students' work in a meaningful learning context can also provide us with further insights. Last but not least, meaningful learning could be integrated into a distance learning environment in order to explore its dynamics to a greater extent in the future.

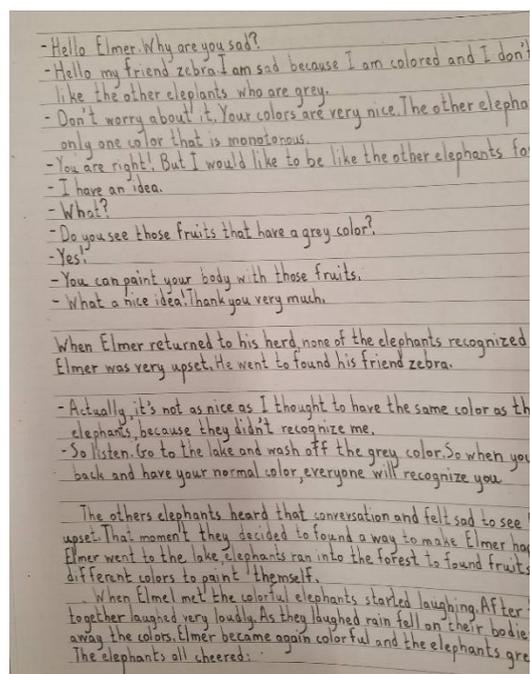
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Appendix A





To cite this article: Korosidou, E., & Bratitsis, T. (2024). Leveraging meaningful learning for technology-enhanced language instruction. *Themes in eLearning*, 17, 55-71.

URL: <http://earthlab.uoi.gr/tel>