Constructing Personal Learning Environments through ICT-Mediated Foreign Language Instruction

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Abstract. The article deals with the concept of student-centred Personal Learning Environment (PLE) in the context of higher education, which is used as a means of transforming foreign language learning and teaching practices. It aims to reveal the opportunities for creating PLEs through incorporating Information and Communication Technology (ICT) in the process of foreign language education. The study focuses on the roles of teachers and students of non-language University majors in designing efficient learning environments highly adapted to changing objectives and student personal needs. The authors reveal the unlimited potential of ICT in constructing PLEs for both in-class activities and informal learning, providing a scope of practical student activities, which imply their active engagement both in and outside the classroom, as well as constructing a flexible, personalized, time and space independent learning environment. Students, teachers, ICT, which is a set of resources based on the use of educational technology tools thoroughly selected and organised in order to manage the content, applying relevant methods of teaching and learning strategies, as well as a learning process, are all regarded as constituents of PLEs aimed at mastering four foreign language skills when taking the course "Foreign Language for Specific Purposes": reading, listening, writing and speaking within personal, academic, and field-related contexts.

1. Introduction

There is widespread recognition in modern Information Age that skills and human capital have become the backbone of modern progress and economic welfare of a country. In the *Feasibility Study Report on the Assessment of Higher Education Learning Outcomes* performed by Organisation for Economic Co-operation and Development, it is stated that "in contemporary knowledge-intensive economies and societies", individual and societal prosperity is retained by "developing and sustaining a skilled workforce, maintaining a globally competitive research base, and improving the dissemination of knowledge for the benefit of society at large" [33]. In addition, advances in technology and all-round digitalization in recent years "have changed the learning behaviours and reshaped teaching methods" [22]. As a result, higher education is regarded as a critical factor in human capital development that demands constant transformations in its performance, quality indicators, and integrated use of communication and educational technologies. Foreign language instruction in non-language institutions of higher education is not an exception and calls for substantial changes in the paradigm of learning and teaching under "heavy digital technological influence" [23].

In this context, it is of ultimate importance to achieve quality education in compliance with modern global trends regarding extensive use of digital media, relevant learning content, "innovative pedagogy, learning by doing and constructing knowledge" [30], which may become the solutions to meet the

modern challenges in foreign language instruction. The need for designing highly engaging activities for students to increase their motivation, proliferation of the Internet, Web 2.0 tools and services, smart applications, social networks, and freely accessible educational resources substantiated the need to consider foreign language learning from these perspectives. Whalley argues that pedagogy must change from "institution-centred to a student-tutor-device focus" that is best done via active learning and incorporating cognitive awareness [35]. The changing understanding of the whole system of knowledge transfer has already established in people's mind, where ICTs play a leading role. They accumulate novel data and information, disseminate them, serve as a means of knowledge transfer, and thus, perform the function of both tools and objects of knowledge. Learning from and learning with technology infers an active student participation, can take various forms and provide interactive environments. It offers unique opportunities to customize learning environments to individual learners [11]. In addition, the principles of user-centred learning approach formed the basis for initiating the idea of constructing personalized active learning environments, which are highly adaptable and responsive to changing needs and facilitate cognitive processes [1].

Thus, the purpose of the article is to further develop and elaborate the existing approaches and ideas for constructing PLEs and the effect of ICT instructional techniques on increasing student progress in foreign language acquisition when balancing teacher control and increased student autonomy.

2. PLEs in Foreign Language Education

Educators agree that "formal education no longer comprises the majority of our learning" because learning occurs in modern age "in a variety of ways – through communities of practice, personal networks, and through completion of work-related tasks" [29]. Barab and Roth claim that it is necessary for the learners to be involved in rich learning situations where learning is characterized by direct functional value rather than the exchange value [2]. In the context of foreign language learning, greater emphasis is placed on the development of learning strategies, drawing structured connections for the most appropriate resources selected and organized by a student, and constructing learning environments in which foreign language acquisition occurs in the context of its use and is highly customized to student's personal needs and abilities.

Personal learning suggests students' autonomy and increased responsibility with their active participation "in learning process by making decisions about how to search, where to search" and the content necessary to meet learning objectives [11]. It is believed that the key ability required from future professionals is related to searching for information, its evaluating and managing, as well as constructing knowledge in foreign language medium. Another requirement to arranging such environments is to provide students' access enabling them to track their individual data and measure progress. All these encourage students to become active agents in organizing their own learning process, in which they are "capable of acquiring and building upon their knowledge" through technology-supported learning environments [3].

In UNESCO Research on Learning Environments, the complete physical, social and pedagogical context in which learning is intended to occur in any designated place as well as distance learning contexts convey the meaning of the term "learning environment" [34]. Gros claims that digital technology has promoted a new vision of learning environments with the need to orchestrate the different locations in which a person learns combining formal and informal situations [17]. The 2020 Horizon report identifies personalized learning as a "general teaching and learning practice that seeks to more finely tune the course experience to the individual needs of the learners" viewing technology as a "major addition to the set of educational technology tools serving the broader educational practice of personalized learning" [13]. The information and communication support systems accommodating individual learning style and needs are regarded as learning environments contributing to the concept of PLEs. They can be considered as a potential means of achieving personalization in learning [23]. The EDUCAUSE Learning Initiative defines PLEs as the "tools, communities, and services that constitute the individual educational platforms that learners use to direct their own learning and pursue educational

goals" [12]. Wilson *et al.* demonstrate consistency of PLE with a competence-oriented approach and describe it as an environment "enabling a wide range of contexts", integrating experiences and collecting resources to support the goals of the user [36].

Such learning environments represent a set of resources based on the use of educational technology tools, appropriately selected and organised with the aim to manage both content and the process of learning [2, 7, 28]. The process of modelling and shaping learning activities performs a valuable educational function in case "the individual develops personal control of different types of (intentional) learning activity (formal or not)" [16]. In this learning activity, the acquisition of the course content is done not through its transmitting but because of student personal activity directed at defining, working out and solving the tasks, conducting self-analysis, self-control and self-assessment of their own learning process, going beyond the boundaries of the classroom and adding to student autonomy. The massive use of technology has become an integral part of foreign language teaching and learning. Technology-enhanced language learning is regarded as an effective approach that enhances student motivation and improves learning outcomes enabling access to constantly updated authentic foreign language materials, online environments and social media, smart language learning tools [8]. Educators also stress the potential of implementing technology-supported learning environment in foreign language for specific purposes teaching that promotes self-regulated learning competency and ICT literacy [38]. Therefore, it can be viewed as an efficient way to not only achieving learning objectives but also sustainable foreign language competency development when equipping "students for tomorrow's workforce and a world in which lifelong learning" is a must [3].

Educators agree that PLEs can be viewed as a solution to self-directed learning in which students manage their learning process [18], a key to personalized learning by adjusting to the educational needs of individuals [37]; they are believed to contribute to developing higher order thinking and student satisfaction [14]. Kompen claims that using a PLE, learner can choose and mix from several alternatives for "capturing, storing, classifying, analysing, creating, sharing, disseminating and processing information, thus creating knowledge" [23]. Creating efficient and viable PLEs produces the required teaching results and enriches teaching environments "as a part of a self-oriented feedback systems with the assistance of the teacher" [10]. In addition, it enables students to perform quality control of the large-scale educational data [37]. Thus, we agree with Castañeda *et al* that PLEs have direct implications on such learning models and processes as adaptive learning, learning analytics, Massive Open Online Courses (MOOCs), all having personalisation at their core [6]. They rely on analytics to support adaptive learning using such components and processes as a language learner's profile and user modelling, collecting and configuring digital e-learning content, aggregating content and tracking progress [6].

In foreign language instruction, learner profiling is greatly facilitated by the Common European Framework of Reference for Languages (CEFR) describing language ability on a six-level scale and providing descriptors specifying progressive mastery of each skill graded on the scale [9]. The CEFR also proposes a self-assessment orientation tool intended to help learners to profile their main language skills in four language activities, i.e. listening, reading, spoken interaction and/or spoken production, and writing activities. Hence, a lot of e-learning resources can both provide the learner with instant online test to determine the level of language proficiency and become a tool for practicing one of the language activities. However, besides forming foreign language competence, students are required to achieve specific learning outcomes within the university course. Thus, there is a challenge of preserving the balance between personalised learning and institutional requirements.

Tochon *et. al* claim that with new approaches to instruction it is now possible to go beyond the boundaries of the classroom thanks to PLEs [31]. Within personal e-learning domain, effective and efficient integration of formal and informal learning becomes possible, allowing unlimited opportunities to create a continuous learning process, in which a student may decide on his or her learning style and pace. PLEs can support deep language and culture learning, provide extensive use of infinite authentic resources and up-to-date context. Tochon *et al.* identified crucial aspects of organising PLEs, among which a special focus for language acquisition is on social involvement that we consider to be the key to language awareness [31], which Carter refers to the development of enhanced consciousness of and

sensitivity to the language forms and functions [5]. Among the values of PLEs, there are cognitive advantages reflecting upon the target language and language learning process. In PLEs, learners make use of high rate of personalisation with the support and data of community members, ownership of their data and aggregation of multiple resources. They can also facilitate text-based and task-based approaches, which develop experiential responses to the language and allows time and space to contextual meanings, language features and text structures [5]. Another advantage is to provide a learner with the ability to see connections between fields, ideas, and concepts, and make decisions about updating the learning process according to the alterations in incoming information [29]. Constructing PLE is of undeniable value in the context of Foreign Language for Specific Purposes instruction due to its benefits of constant information updating and "situating learners in real-world scenarios" [17].

However, in order to connect a range of available resources and create an efficient learning system within a personally managed space, it is to be organised by both a student and a teacher who is capable of guiding students in incorporating Web 2.0 tools and services in their learning. Such tandem can help support the search and supply of relevant material, coordinate learning process, consult in solving problems and seeking for solutions, as well as assess student progress and achieving objectives. What is more, it is likely to become a key factor in constructing positive foreign language learning environment and create strong motivation based on real or imagined expectations and potential or actual rewards for the efforts.

The results of the 2020 Horizon surveys of applying technology-integrated approach, presented in the report, verified the gains in the rates of student success resulting from combination and integration of the technology and active-learning engagements. At the same time, it is stated that technology is necessary but not sufficient to enable student success. It rather demands the leverage of online, blended, adaptive, and active learning throughout the course program [13]. A good example of such a combination may be provided using a system of acquiring knowledge according to Bloom's taxonomy. The experience of some universities testified the ratio of using adaptive technology by students at the two bottom layers of the taxonomy (remembering and understanding). Then, on the remaining four levels (applying, analysing, evaluating, and creating), the use of flipped model proved to be effective, when the instructor organizes activities, based on active learning, to be done in class [13]. Thus, foreign language acquisition may require a tandem of active classroom activities and wide use of ICT-mediated instruction in open, dynamic, efficiently-structured and personally adjusted PLEs.

To provide efficient support for students in designing PLEs, it is the responsibility of a teacher to give students an overview about how ICT can be used effectively to enhance both formal and non-formal learning process [7], help them incorporate Web 2.0 tools and services for formal studies, guide students in their learning to use Web 2.0 for lifelong learning and preparing higher education students for future employment [24]. In order to achieve learning objectives, students can get help from their language teachers when building an initial catalogue of tools, which can be used to practice four language skills: e.g. reading, writing, listening and speaking. Online encyclopaedias and dictionaries, open language learning resources from British Council and Cambridge English, National Geographic, engVid etc. (for the English language), Goethe-Institute, Deutsche Welle (for the German language) can become powerful smart tools for creating authentic environment to improve vocabulary, reading and listening comprehension. Social networks, forums, videoconferences, blogging and video presentations are helpful to practice such productive skills as speaking and writing. A more detailed approach to the use of ICTs in the Foreign Language for Specific Purposes university course will be presented in Chapter 3.

3. Foreign language acquisition through ICT-mediated instruction

The modern educational world, according to Torres and Castro, encompasses the following features:
- Today's students are social. They like to get in touch with peers and therefore have preference to do group activities.
- Students are inclined to discover, explore, experiment and analyse critically.
- Modern learners are inclined more to "do" than to "listen".

- Learning must be student-centred.
- Work must be interdisciplinary and project-based.
- Learning must be linked with reality.
- There are multiple intelligences and different learning styles.
- Learning should be comprehensive, permanent and meaningful [32].

These features entail that classroom activities may be replaced or enriched by online learning experiences, which have increasingly been penetrated into the university life and foreign language classroom, allowing varying degrees of interaction or just time alone in independent study and learning activities, reshaping higher education through Internet-based content delivery and various forms of interaction.

Among a variety of terms describing the notion of applying technology in classroom, and foreign language learning in particular, we stick to the term "ICT-mediated instruction" introduced by Blurton [4], which implies delivering knowledge "via a technological channel such as television, radio, or a computer and network" [4].

Houcine lists the following advantages of ICT impacts on learners:
- ICT increases learners' motivation and thus enhances personal commitment and engagement;
- ICT improves independent learning;
- Learners' collaboration and communication are more important;
- Learners' attainment and outcomes are improved [19].

Taking into account these advantages, we can assume that ICT hugely influences students' foreign language learning acquisition, modifies their learning environment, and shapes their foreign language learning outcomes. The learning environment, both formal and informal, is thus enriched with new means, forms, modes and methods of learning, as well as an extended language- and field-related content. Teachers and learners are confronted with a huge amount of authentic materials in the target language. These materials can be used both at the class preparatory stage and during the class. The potential of ICT lies in the fact that learners can construct the learning process for themselves and eliminate the difficulties by using the media they are familiar with. Besides, ICT is very helpful when the classes are conducted outside the country of the target language as it brings the foreign language world into the seminar room. Although our students belong to the "digital generation" or "generation 2.0", these technologies are not *per se* relevant and motivating; and teachers have thus to apply such methods of teaching and such content that would make students feel interested in and find themselves engaged in online and offline foreign language learning activities.

Foreign language is a constituent of study programs in all major fields of study in higher school, which is beneficial for students, on the one hand. On the other hand, the insufficient volume of class hours, particularly for non-language students, makes foreign language university teachers find themselves at a crossroad, and thus, makes them think of what and how to teach and look for the ways of improving their teaching. The foreign language teacher faces a range of rapidly appearing new ICTs as online materials challenge them didactically and they are responsible both for the process of learning and interaction.

In order to start the learning process it is not enough only to introduce the learners to new media. Planning a class, the teacher has to consider the following:

– tasks have to be developed in such a way that the ICT introduction fosters solving the tasks set;

– it is advisable to choose such tools in classroom that match the target audience, incl. their chosen future professional field;

– the introduction of tools has to be organized in such a way that they support the cooperative learning and enable students to construct a flexible, personalized, time and space independent learning; this can lead to the self-led expansion of personal learning experience, i.e. students can develop their foreign language skills outside the classroom, expanding their PLEs.

In order to construct an effective foreign language learning environment, we share the Gros' opinion that the learning environment must provide personalized assignments and/or formative feedback, and should include pedagogical strategies that support:

1. Conversation: the learning environment can engage the learner in a dialogue or facilitate a group dialogue on a relevant topic or problem;

2. Reflection: the learning environment can generate self-assessment based on students' progress and performance, preferably suggesting activities and attributes in the learning environment that can be adjusted to improve overall effectiveness;

3. Innovation: the learning environment uses new emerging technologies and leverages innovative technologies in creative ways to support learning and instruction;

4. Self-organisation: the learning environment can rearrange resources and control mechanisms to improve its performance over time based on data that are automatically collected and used to refine how the environment interacts with learners in various circumstances [17].

Concerning the issue of the efficiency of digital tools to be used in constructing highly efficient PLEs, there are four constituent factors presented in Figure 1 to name:

- students and teachers as participating actors;
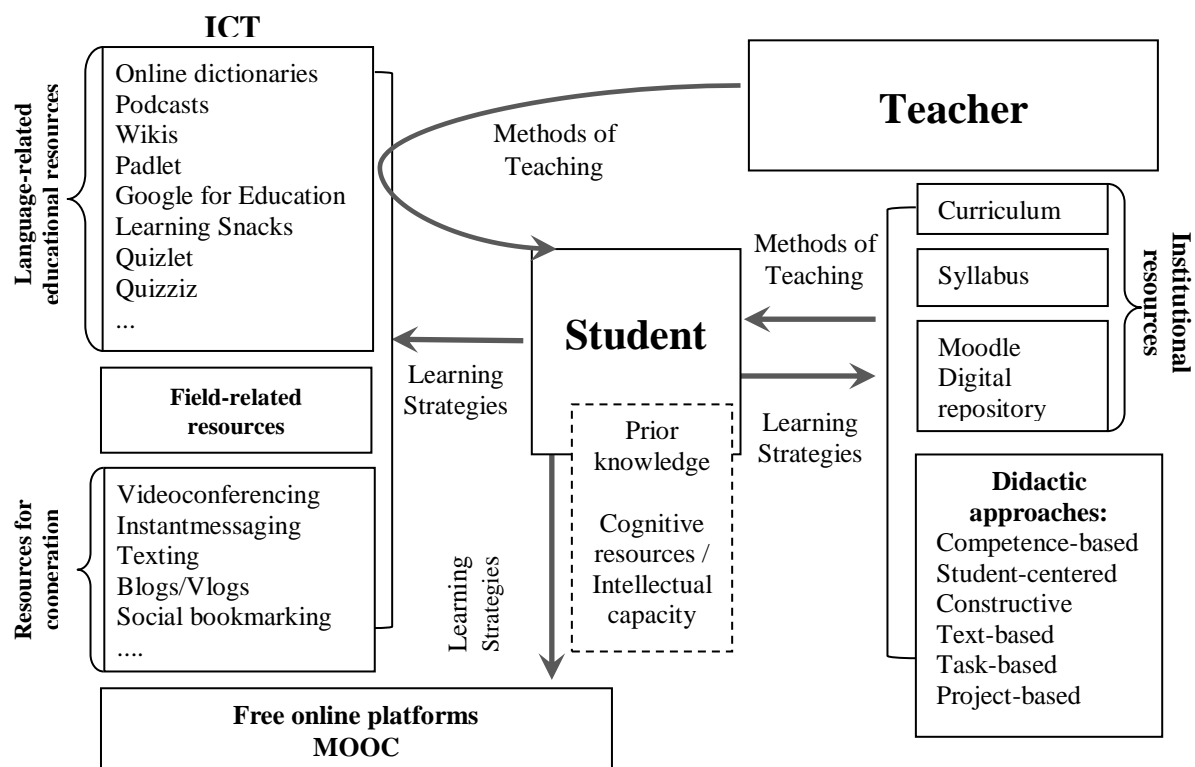- ICT;
- learning processes.

Figure 1. Model of Personal Learning Environment for foreign language acquisition

The authors' own experience underlay the model proposed in Figure 1. It depicts the process of modelling PLEs of non-language university students within the Foreign Language for Specific Purposes course, where the foreign language teacher acts as a facilitator coordinating the resources, using the appropriate didactic approaches and teaching methods. Judging from experience, it helps in choosing one of the conceptual framework approaches to improving individual learning process in a formal educational environment. It becomes helpful guidance for users to maintain coherence between higher rate of personalisation and the need to achieve learning outcomes defined in the course syllabus, to balance formal and informal contexts alongside with creating the necessary skills for lifelong language learning. Students build their PLEs basing on their prior knowledge and using their cognitive resources. They apply learning strategies needed to acquire or improve foreign language skills and achieve the

learning outcomes identified in the syllabus while working on institutional platforms such as Moodle and using the Digital Repository as a source of the content to be studied. Teachers, on the other hand, act as facilitators in the educational process. Basing on the syllabus and filling the Moodle platform and digital repository with the appropriate and course-relevant educational materials, so that they are "available at all times and are accessible from any device" [17], teachers improve and adapt the process of foreign language acquisition via various ICT tools, which can be divided into language-, field-related and resources for cooperation. Applying them, it is necessary for teaching staff to look for the teaching methods that mostly suit the needs of students and help develop their foreign language skills by means of ICT. Teachers are also challenged nowadays by a great variety of free online platforms offering various foreign language courses, which students can choose from and which can be acknowledged by a higher educational establishment within the volume of hours stated in the certificate obtained in case the course was successfully completed.

Students can be identified by specific characteristics and features, e.g. their subject-specific or interdisciplinary prior knowledge, their cognitive resources or intellectual capacities, their values and attitudes, which form a complex of learning strategies to be applied by acquiring a new piece of foreign language knowledge. Thus, one of the main attributes of effective PLE is a learner profile portraying "the individual characteristics of each learner's strength, preferences, motivations, etc." [26], tools to continuously measure individual performance and evaluate progress.

Teacher is characterized by being knowledgeable about didactics and has to be ICT-didactic competent, has specific understanding of the profession, the values and attitudes, which influence the design of teaching-learning situations in different ways. ICT allows teachers to optimise instruction strategies and methods by analysing students' performance data, by sorting out educational resources according to the matching degree from high to low, and by providing personalised adaptive learning services that can be well compatible and integrated with differentiated instruction, adaptive learning and life-long learning [25].

ICT can be described by different peculiarities and features, which are important both separately and in combination with each other. Media offer is marked with specific content, objectives, forms of presentation, process and navigation structures, interactivity properties, coding types, addressed sensory modalities, design techniques or learning theoretical implications. Depending on the offer, some of these properties can have greater or less importance, e.g. it would become a digital medium having the character of a tool (e.g. a word processor or a video editing tool), no content component or specific objectives, so that these aspects would not come into play. On the other hand, the process or interaction, its structures or the forms of presentation are relevant to a learning programme. New ICTs give the student and teacher the ability to control, manipulate and contribute to the information environment. On the lowest and least valuable level, this may simply mean the student controls the pace and order of a presentation. But much more is possible. Using ICT, students may not only make choices about the pace and order of a presentation, but may choose topics; take notes; answer questions; explore virtual landscapes; enter, draw or chart data; run simulated experiments; create and manipulate images; make their own multimedia presentations, communicate with others, etc.

Learning process can also be done through various constitutive characteristics for which, e.g. teaching goals, contents, the didactic structures of the process, social forms, and teaching methods on the part of a teacher, as well as learning strategies applied by a student, have to be considered. Blurton describes these constructivist methods of learning as "self-paced, self-directed problem-based ... learning processes" [4].

In such learning process, students gain responsibility for finding information, setting goals, deciding on appropriate learning paths and iterations, monitoring and evaluating their progress that help them develop self-regulated learning skills. Another defining factor is highly motivating context that can strongly influence academic performance. Thus, it is of critical importance to pay special attention to developing the necessary self-regulated learning skills and strategies. Apart from obtaining language, speech and socio-cultural knowledge in a target language, formation of language and speech strategies, which help choose an appropriate learning path in order to achieve the best result within the shortest

time period, is another constituent of foreign language content. In foreign language learning, there are some crucial aspects for language acquisition: self-awareness (being aware of one's learning style); language awareness (conscious language perception); self-regulation, planning and monitoring one's learning process. They are mostly referred to cognitive and metacognitive strategies, which can be best developed in motivating constructivist environment such as PLE. The effective role of these strategies is claimed to be conspicuous to language acquisition and self-regulation mastering the four language activities: e.g. oral communication, oral comprehension, reading comprehension and writing [26].

Lim mentions students' familiarity with using Web 2.0 tools and their positive attitude toward using these tools and services for learning, but at the same time he notes that students reference challenges with using Web 2.0 in a carefully designed and structured manner [24]. No doubt that Web 2.0 tools can provide students with extra opportunities to do meaningful language learning tasks from the comforts of their own homes or local libraries. However, Web 2.0 tools work best when students are asked to develop, create, and share their work online [20]. That is why, to take advantage of all these facilities and suggest the most effective ways of incorporating ICT for developing four language skills: speaking, reading, writing and listening in formal contexts, a plethora of ICT can be used. Table 1 offers a range of ICT tools actively used by authors along with a possible student activity.

Table 1. Foreign language Personal Learning Environment toolset

Language skill	ICT tool		Student activity
Reading	Online dictionary	https://dictionary.cambridge.org/dictionary/english/	Find the *xxx* word in the dictionary. Find out its meaning/s. Read the examples given.
		https://www.duden.de/	
	Wiki	https://en.wikipedia.org/wiki/Main_Page	Search the Wikipedia on the topic given.
	Blog / professional blog	http://edublogs.org/	Subscribe to the blogs of other students of the group. Follow these blogs and post personal comments.
		https://www.blogger.com/about/?bpli=1	
		https://ru.wordpress.com/	
	Social bookmarking	https://www.reddit.com/	Upvote, downvote or comment one story a day you find interesting during a week. Go back through your account at the end of the week. Choose one of the bookmarked books for reading.
		https://digg.com/	
	Social bookmarking	https://stumbleupon.com/	Bookmark interested things on the topic given each day during a week. Go back through your account at the end of the week. Read the bookmarked stuff.
		https://twitter.com/explore	
	Social networking site / SNS	https://twitter.com/	Read posts on the topic given.
		https://www.facebook.com/	
		https://www.instagram.com/?hl=uk	
	SNS	https://web.telegram.org/	Subscribe to a foreign language learning channel.

	Learning Snacks	https://www.learningsnacks.de/	Read a piece of information shared by other students on the topic given.
	Games	https://www.gamestolearnenglish.com/	Read the description and click on the matching image.
Listening	Podcasts	https://www.bbc.co.uk/podcasts https://www.iheart.com/podcast/ https://www.podcastsinenglish.com/ https://learnenglish.britishcouncil.org/general-english/podcasts	Search an ICT tool for podcasts related to the topic. Subscribe to at least two podcasts.
	You Tube as audio/video sharing library	https://www.youtube.com/	Search for an interesting film in a target language. Watch this film. Recommend this film to your group mate.
	Video-conferencing	https://zoom.us/ https://www.skype.com/uk/ https://www.microsoft.com/uk-ua/microsoft-365/microsoft-teams/free https://www.adobe.com/products/adobeconnect.html	Attend a conference. Listen to the speakers.
	SNS	https://www.tiktok.com/en/	Find a short video on the topic given. Watch this video.
	Games	https://www.gamestolearnenglish.com/	Listen to the words/numbers and click on the matching images.
Writing	Blog	https://www.blogger.com/about/?bpli=1 https://ru.wordpress.com/	Create your own blog. Post a personal reflection on the given topic every day.
	Online journal	https://penzu.com/	Create your online journal (on the topic you desire). Write an entry to your online journal.
	Quizlet	https://quizlet.com/ru	Write/Type a definition to the word you see. Type the term that goes with the definition before it reaches the bottom of the screen.
	Learning Snacks	https://www.learningsnacks.de/	Write a piece of information you want to share on the topic given.
	Padlet	https://padlet.com/	Fill in your own portfolio Padlet board.
	Games	https://www.gamestolearnenglish.com/	Guess letters to spell out a hidden word.
	SNS	https://www.whatsapp.com/	

		https://www.messenger.com/ https://www.viber.com/ https://www.instagram.com/	Text your friends (group mates) in a target language. Respond to the instant messages received from your friends (group mates) in a target language. Create a photo blog. Invent metaphors within chosen photos. Make up and document some context to photos. Practice *xxx* grammatical structures on photos.
		https://web.telegram.org/	
	SNS	https://twitter.com/ https://www.facebook.com/ https://www.instagram.com/	Write posts on the topic given in a target language.
Speaking	Video-conferencing	https://zoom.us/ https://www.skype.com/uk/ https://www.microsoft.com/uk-ua/microsoft-365/microsoft-teams/free https://www.adobe.com/products/adobeconnect.html	Attend a conference. Present the results of your research to other conference participants. Respond to the questions asked. Put your own questions to other conference speakers.
	Webinar	https://meet.google.com/ https://zoom.us/ https://www.microsoft.com/uk-ua/microsoft-365/microsoft-teams/free	Attend a webinar. Voice your own point of view on the topic discussed. Put questions to other webinar participants. Agree vs. disagree with other webinar participants.
	SNS	https://www.tiktok.com/en/	Shoot you own short video on the topic given. Upload the video on the SNS.
	Games	https://www.gamestolearnenglish.com/	Guess *xxx* by forming questions.

The table offers a range of options available to students, among which they can choose the applications that can better suit their needs and abilities, interests and learning styles. Student activities within each language skill presented in the table correspond to the hierarchical structure of learning content according to Bloom's taxonomy. This structure is based on working with educational content at different levels (materials for learning – materials for practices – materials for creation) making students apply different levels of language cognition (remembering to creating) and forcing teachers to choose student-relevant instructional methods. As the skills specific to foreign language learning do not form a hierarchy, but are interrelated and dependent on each other, the highest level of language learning (creation) depends on the lower levels of the structure, namely understanding, analysing, evaluating and applying knowledge. Thus, the student activities for reading and listening skills formation mostly correspond to the lower levels of language learning, whereas the activities for writing and speaking skills are based on the previous ones and require student's ability to use information in a new way, to break it down into its essential parts, to judge and criticize information, to establish cause-and-effect relations, and to create something new from different elements of information.

Although the fact to be acknowledged is that these resources are constantly changing, are being updated and added with new functions, this preliminary toolset can be of great value forming the users' ability to learn new tools through the learning curve having some previous experience.

Learners acquire knowledge in both informal and formal contexts, doing so in informal contexts, especially with and via the media. This means that university-based learning processes and informal learning processes have to be related to each other much more strongly. ICTs play an important role as a means of learning processes and as a means in the process of constructing foreign language personal learning environment. In addition, teachers have to be aware of the fact that foreign languages can be learnt by students in informal contexts, i.e. in massive open online courses (MOOC) on different free online platforms, like Coursera, Prometheus, etc., which allow online learners "to learn asynchronously, synchronously or autonomously" [15].

Moreover, the use of apps contributes to the enhancement of the learner's cognitive capacity, the student motivation to study in both formal and informal settings, the learner autonomy and confidence, as well as the promotion of personalized learning, helping low-achieving students to reach their study goals. However, to achieve the effectiveness of these apps, it is desirable to design, plan and implement them with caution, according to students' needs, and to deliver multiple language skills in authentic learning environments [21]. To augment the traditional foreign language learning, the application of ICT is preferable, but their meticulous choice has to be done according to what ICT devices are at hand or could be available for students in class or at home to meet the needs of each student and allow them to create a comfortable learning environment. To choose interesting, motivating and affordably challenging educational content, the English teachers can make use of the following websites: Ted Talks, British Council, ESL Brain, etc., blogs: English Outside the Blog, English with Adriana, etc., providing free educational materials for all language learning levels according to the Common European Reference for Languages. Some practical applications of ICT can also be presented via learning vocabulary on a range of platforms which allow teachers to diversify and visualise the classroom activities and make students concentrate on the topic vocabulary, allow them to extend and network their knowledge for themselves. These learning by doing activities include mindmaps, own associations, crossword puzzles, Bingo, gapped texts, quizzes, cards, Trimino, etc., which can be practised on Padlet, Learning Snacks, Quizlet, Quizizz, etc.

Internet remains a very important source to find the audio-visual materials by facilitating a transversal use of language in different contexts. In foreign language teaching, ICT is of an added value because we have a fast access without time limit to different types of texts (text, audio, video), which can be used directly or indirectly through the learning process. We can manipulate digital data in whichever text (text, image, and video) and so we can create new resources.

SNS technologies, as it is seen from the table, are not to be underestimated as well, and thus, have been investigated by many researchers in the field of foreign language acquisition since the time of their emergence. SNSs are regarded as a type of social media that foreground personal profile and network activity; they are open, dynamic and offer collaboration options. As people need socializing with others, information sharing and joint activities, education practitioners and researchers have realized their potential and have been trying to integrate these means for communicative practice into teaching, creating not face-to-face authentic communication with native speakers. Another benefit is gathering feedback for in-class activities through anonymous polls and questionnaires possible to be conducted on e.g. Telegram. Blogs, short for weblogs, which are recognized as ideal spaces for culture learning and intercultural exchange and continue to hold potential for language learning. A framework of blog types can be offered for educational application: tutor blogs as instructor-maintained collections of class references and resources, learner blogs as online journals or portfolios for individual students, and class blogs as spaces for collaboration and interaction.

In recent years, an increasing interest from educators is accrued by digital games characterised by interactivity, multimodality, and immersion creating extremely popular environment. Educators agree on "positive effects of game play on motivation, willingness to communicate, language socialisation" [27]. These games foster target language vocabulary output, active and volunteer engagement in the

target language interaction, improve fluency and discourse management practice [27] as well as develop cognitive and metacognitive strategies for language learning. Another advantage is authenticity of gaming environment with both language learners and native speakers as participants.

ICT-mediated instruction leads to students' increased autonomy, as they can choose the format (text, audio, video) of authentic foreign language learning material and tailor it to their needs, both personal and professional going for synchronous or asynchronous mode of learning. Thus students build up their own pathways in foreign language learning in a self-directed manner, piling up their own experiences from a constructivist perspective in effectively tailored PLE.

Nevertheless, various learning experiences are synthesised, can complement each other, be planned or orchestrated to run in parallel, thus creating the environments, learning in which enables increasing students' motivation and gain ratio.

4. Conclusions

PLE is considered today to be a surrounding that enhances student motivation, improves learning outcomes, and favours student progress in learning, including foreign languages. Because of different pace of learning, different attitudes, background and abilities, students find themselves at different levels of foreign language knowledge in higher educational establishments. In order to succeed, students need to create personal learning environment basing on their prior knowledge and cognitive resources through using the tools, forms, and materials that match every student. As ICT is unavoidable today, and young people are best equipped with it and are familiar with its usage, teachers cannot but apply them in their teaching processes, making them closer and more appropriate to help students immerse in the world of authentic foreign language material that is extensively offered by the Internet. Using different ICTs accessible for students and the content that can be constantly updated enhances student motivation to become a life-long foreign language learner, on the one hand, and to enrich the traditional teaching practice, on the other.

A range of approaches (competence-based, student-centred, constructive, task-, text-, and project-based) favour the application of ICT in everyday teaching and learning practice. The model developed by the authors visualises that ICT is applied by teachers after thorough consideration of what and how to teach. Mobile devices, laptops, tablets, etc. as tools and SNS, blogs as a means are used to construct flexible, personalized, time and space independent learning, to expand personal learning experience through not face-to face authentic communication and authentic material. Google services and other videoconference platforms allow reaching students outside the classroom and conduct both foreign language classes outside the classroom and for students to perform tasks in teams. ICT helps a student, who becomes more and more autonomous, define what learning strategies can be applied by learning different content from both printed and online sources, which are placed on institutional (University) and non-institutional (free online) platforms. Thus, a student is free to choose what, where and when to learn, expanding their foreign language learning experience to outside the classroom. A range of online resources for both teachers and learners are offered to be used in mastering four foreign language skills: reading, listening, writing and speaking, together with the proposed activities.

Further studies have to be based on quantitative research methods to investigate age and gender differences in using ICT, the extent of autonomous application of ICT for language learning, as well as on the application of adaptive learning environments in tertiary foreign language education in non-language universities.

References

[1]   Atwell G 2007 Personal learning environments – the future of e-learning *eLearning Papers* **7** https://www.researchgate.net/publication/228350341_Personal_Learning_Environments-the_future_of_eLearning

[2]   Barab S A and Roth W-M 2006 Curriculum-based ecosystems: supporting knowing from an ecological perspective *Educational Researcher* **35** **(5)** pp 3–13. https://www.researchgate.net/publication/228679990

[3] Blaschke L M 2019 The pedagogy–andragogy–heutagogy continuum and technology-supported personal learning environments *Open and Distance Education Theory* (Springer Briefs in Education) https://doi.org/10.1007/978-981-13-7740-2_9

[4] Blurton C 1999 New directions of ICT-use in education. *UNESCO World's Communication and Information Report* https://www.academia.edu/36107452/New_Directions_of_ICT-Use_in_Education

[5] Carter J 2003 Language awareness *ELT Journal* **57 (1)** DOI: 10.1093/elt/57.1.64

[6] Castañeda L, Dabbagh N and Torres-Kompen R 2017 Personal learning environments: research-based practices, frameworks and challenges *Journal of New Approaches in Educational Research* **6 (1)** pp 1–2 https://doi.org/10.7821/naer.2017.1.229

[7] Castañeda L and Soto J 2010 Building personal learning environments by using and mixing ICT tools in a professional way *Digital education review* **18** pp 9–25

[8] Cinganotto L and Cuccurullo D 2016 PLE & PLN for language learning and teaching: A case study *International Journal for 21stCentury Education* **3** DOI: 10.21071/ij21ce.v3i2.5853

[9] Council of Europe 2001 *Common European Framework of Reference for Languages: Learning, teaching, assessment* Cambridge: Cambridge University Press www.coe.int/lang.

[10] Dabbagh N and Kitsantas 2012 Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning *The Internet and Higher Education* **15 (1)** pp 3-8 DOI:10.1016/j.iheduc.2011.06.002

[11] Drexler W 2010 The Networked student model for construction of personal learning environments: Balancing teacher control and student autonomy. *Australasian Journal of Educational Technology* **26 (3)** pp 369–385. https://ajet.org.au/index.php/AJET/article/view/108

[12] EDUCAUSE Learning Initiative (ELI) 2007 The seven things you should know about http://www.educause.edu/7Things

[13] EDUCAUSE Horizon Report 2020 Teaching and learning edition https://library.educause.edu/-/media/files/library/2020/3/2020_horizon_report_pdf.pdf?la=en&hash=08A92C17998E8113BCB15DCA7BA1F467F303BA80

[14] Elfeky A I M 2019 The effect of personal learning environments on participant's higher order thinking skills and satisfaction *Innovations in Education and Teaching International* **56:4** pp 505–516 DOI:10.1080/14703297.2018.1534601

[15] Fan L-H 2018. On computer and foreign language teaching and learning in big data era *International Journal of Emerging Technologies in Learning* pp 236-245 doi: https://doi.org/10.3991/ijet.v13i05.7717

[16] Fiedler S and Väljataga T 2011 Personal learning environments: concept or technology? *International Journal of Virtual and Personal Learning Environments* **2(4):1-11** DOI: 10.4018/jvple.2011100101

[17] Gros B 2016 The design of smart educational environments *Smart Learning. Environment* **3:15** https://doi.org/10.1186/s40561-016-0039-x

[18] Haworth R 2016 Personal learning environments: A solution for self-directed learners *Techtrends* **60** pp 359–364 https://doi.org/10.1007/s11528-016-0074-z

[19] Houcine S 2011 The effects of ICT on learning/teaching in a foreign language http://www.pixel-online.net/ICT4LL2011/common/download/Paper_pdf/IBL69-437-FP-HoucineICT4LL2011.pdf

[20] Isisag Korkut U 2012 The positive effects of ICT in foreign language teaching. https://conference.pixel-online.net/conferences/ICT4LL2012/common/download/Paper_pdf/235-IBT107-FP-Isisag-ICT2012.pdf

[21] Kacetl J and Klimova B 2019 Use of smartphone applications in English language learning – A challenge for foreign language education *Educ. Sci.* **179** DOI: https://doi.org/10.3390/educsci9030179

[22] Kinshuk, Chen N-S, Cheng I-L *et al* 2016 Evolution is not enough: revolutionizing current

learning environments to smart learning environments *International Journal of Artificial Intelligence in Education* **26** pp 561–581 https://doi.org/10.1007/s40593-016-0108-x

[23] Kompen R T *et al* 2019 Personal learning environments based on Web 2.0 services in higher eduaction *Telematics and Informatics* **38** pp 194–206 https://doi.org/10.1016/j.tele.2018.10.003

[24] Lim J and Newby T J 2020 Preservice teachers' Web 2.0 experiences and perceptions on Web 2.0 as a personal learning environment *J Comput High Educ* **32** pp 234–260 https://doi.org/10.1007/s12528-019-09227-w

[25] Peng H, Ma Sh and Spector J M 2019 Personalized adaptive learning: an emerging pedagogical approach enabled by a smart learning environment *Smart Learning Environment* **6** 9 https://doi.org/10.1186/s40561-019-0089-y

[26] Rahimi M and Katal M 2012 Metacognitive strategies awareness and success in learning English as a foreign language: an overview *Procedia – Social and Behavioral Sciences* **31** pp 73–81 https://www.researchgate.net/publication/257715061_

[27] Reinders H 2017 *Digital games and secong language learning Language* (Education and Technology, Encyclopedia of Language and Education) eds S Thorne, S May (Heidelberg: Springer) pp 329–343 https://www.researchgate.net/publication/319382475

[28] Schön S 2008 On the way towards personal learning environments: seven crucial aspects *eLearning Papers* https://www.researchgate.net/publication/28264175

[29] Siemens G 2005 Connectivism: A learning theory for the digital age *International Journal of Instructional technology and Distance Learning* https://jotamac.typepad.com/jotamacs_weblog/files/Connectivism.pdf

[30] Tarnopolsky O 2018 Principled pragmatism, or well-grounded eclecticism: a new paradigm in teaching English as a foreign language at Ukrainian tertiary schools? *Advanced Education* **10** pp 5–11 DOI: 10.20535/2410-8286.133270

[31] Tochon F V *et al* 2014 Online instructional personal environment for deep language learning *International Online Journal of Education and Teaching* **1** **(2)** https://www.researchgate.net/publication/259714609

[32] Torres A and Castro P 2014 Active learning spaces in schools and higher education *The European Conference on Technology in the Classroom* pp 139–148 https://papers.iafor.org/proceedings/conference-proceedings-ectc2014

[33] Tremblay K *et al* 2012 Assessment of higher education learning outcomes *OECD Feasibility Study Report – Design and Implementation* **1** p 272 http://www.oecd.org/education/skills-beyond-school/AHELOFSReportVolume1.pdf

[34] UNESCO Institute for Statistics 2012 *A Place to Learn: Lessons from Research on Learning Environments Style* (Montreal: UNESCO-UIS) p 86 https://unesdoc.unesco.org/ark:/48223/pf0000215468

[35] Whalley B *et al* 2020 *Developing active personal learning environments on smart mobile devices* Advances in Intelligent Systems and Computing **1070** (Springer, Cham) https://doi.org/10.1016/j.tele.2018.10.003

[36] Wilson S, Liber O, Johnson M, Beauvoir Ph, Sharples P and Milligan C 2007 Personal learning environments: Challenging the dominant design of educational systems *Journal of e-Learning and Knowledge Society* **3** **(2)** pp 27–38 http://www.somece2015.unam.mx/recursos/ACC/PLE_challenging_dominant_design_of_educational_systems.pdf

[37] Wu J-Yu, Hsiao Yi-Ch and Nian M-W 2010 Using supervised machine learning on large-scale online forums to classify course-related Facebook messages in predicting learning achievement within personal learning environment *Interactive Learning Environments* **28:1** pp 65–80 DOI: 10.1080/10494820.2018.1515085

[38] Xu X, Chan F M and Yilin S 2018 Personal learning environment: an experience with ESP teacher training *Interactive Learning Environments* DOI: 10.1080/10494820.2018.1552872