

# Using Smart Devices in Forming the Foreign Language Competency of Economics Students

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**Abstract**—This article presents a study on the effectiveness of using smart devices in teaching foreign languages. The research involved conducting an experiment with students (N=195), allowing for a comparison of learning outcomes between groups of those using smart devices in the process of learning a foreign language and those without them. The results demonstrate the benefits of practically using smart devices in foreign language acquisition, significantly improving the quality of instructional material presentation and its absorption by students, enriching the educational process, increasing motivation for language learning, fostering closer collaboration between teachers and students, introducing variation in homework and independent student work, and thereby creating new conditions for self-education and individual learning trajectories. The authors conclude that smart technologies eliminate the limitations inherent in traditional methods, taking teaching and learning beyond the classroom. Implementing smart technologies in students' practical activities in professionally oriented foreign language classes promotes the development of all four language skills – reading, writing, speaking, and listening, improves communicative abilities, and helps foreign language learners adapt to international testing.

**Index Terms**—smart technologies, smart society, distance learning, interactive board, smart education

## I. INTRODUCTION

In a period of continual global systemic change, the role of information communication, products, and services in the socio-economic and cultural life of people is growing. At this stage of development, the information society undergoes an evolutionary transformation, transcending to a new level – a smart society (Ardashkin, 2017).

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At the current stage of information and communications technology (ICT) development, some needs cannot be met by traditional educational technologies or even e-learning technologies. While e-learning technologies can offer some degree of personalization, they may not be able to fully address the unique learning needs, preferences, and pace of each learner. As technology continues to advance rapidly, both traditional and e-learning methods may struggle to keep up with the latest innovations and the emerging needs of learners and the job market.

At the moment, we are witnessing a transition from e-learning to smart education (Huang et al., 2012). The new smart community drives the change from the traditional learning model to e-learning and smart education (Zhu et al., 2016). Smart education allows for generating new knowledge and shaping the personality of a smart person perfectly proficient in ICT tools for information retrieval and analysis and innovation (Dneprovskaya et al., 2015). With that, recognition of the position of smart in education is faltering between the use of smartphones, tablets, iPads, and other similar devices to deliver knowledge to students and the formation of an integrated intelligent virtual learning environment, particularly using smart devices (Koper, 2014).

Following a key objective of contemporary education – forming students' consistent motivation to obtain knowledge and at the same time exploring new forms, methods, and techniques for the transmission and assimilation of this knowledge, the teacher, by using smart devices, not only enhances cognitive interest in the learning process but also improves the quality of education itself.

Analysis of the current state of the research problem suggests that although the organization of the learning process using modern technology has been under study over the past few years, the topic remains relevant. This is especially true concerning the formation of foreign language (FL) competency, which is a complex, holistic, and integrative structure that allows one to communicate effectively with native speakers of another language at a professional level and to feel confident in an FL socio-cultural environment through the mastery of different ways of using an FL. This competency characterizes the theoretical and practical readiness for FL activity of economic specialists and the development of appropriate character traits in students during their university studies.

In this connection, there is a need to substantiate the use of smart devices in forming the FL competency of economics students as part of their training.

## II. LITERATURE REVIEW

Educational technologies that match the obsolete technological paradigms and industrial society rely on the so-called academic education system. It is attuned to the requirements of the job market; in it, knowledge is transferred in classrooms during lessons (classes), and the teacher simultaneously performs the functions of knowledge transmission and control/assessment of learning outcomes. This system is incapable of satisfying the demands of the knowledge economy, and the answer to this has become smart education.

The concept of smart educational technology is understood by researchers as an interactive educational complex that allows creating, redacting, and sharing multimedia learning materials both in the classroom and in distance learning (Ardashkin & Surovtsev, 2021).

A software package enables the teacher to monitor students' actions, display all students' work screens on the board, lock students' monitors, and send instructional material, such as quizzes, to all computers from the interactive whiteboard (Hwang, 2014). The use of interactive whiteboards and smart laptops in teaching practice brings improved concentration in students, faster assimilation of learning material, and, as a consequence, increased academic performance (Ardashkin et al., 2018).

Using smart technologies, teachers introduce variety in students' homework and independent work on an FL and thereby create new conditions for self-education and individual learning trajectories (Dimitriadou & Lanitis, 2023; Palanivel, 2020). Smart technologies eliminate the limitations inherent in traditional methods taking learning and teaching beyond the classroom (Tiwari, 2017) and allow learning anywhere and at any time and spending breaks and travel time more productively (Spector, 2016). Working with smart technology majorly elevates the role of the teacher (tutor) as an organizer and coordinator of the learning process who gains the ability to manage the training process with more flexibility considering the individual capabilities of each student (Borisenko & Volodina, 2015).

Thus, active implementation of smart technologies in the day-to-day learning process accelerates and improves not only the technique of knowledge transfer but the active perception and assimilation of it as well.

Technological modernization of modern education is starting to concern not only IT professionals but also teachers and methodologists, which gives rise to numerous discussions in scientific circles and raises the issue of creating a unified educational environment based on the extensive use of modern high-speed ICT (Knox, 2019).

One direction in the realization of such an educational environment together with the active development of online educational resources and technologies is the utilization of smart devices in training. Several scientific studies in this sphere note the efficiency of using smart devices in teaching (Algoufi, 2016), which allows for the formation of relevant ICT competencies in students and preparing them for future professional work (Alwraikat, 2017) while also ensuring a significant rise in the level of students' theoretical and practical training in various areas of expertise (Heflin et al., 2017).

In turn, specialists in FL teaching are also starting to actively use smart technologies in their practice, and the methods to introduce smart technology to professionally oriented FL classes have become a research topic for many

scholars. In particular, a study by Leis et al. (2015) explores the feasibility of using mobile technology for independent work in the study of professionally oriented FL.

Research findings indicate that the application of smart technologies in professionally oriented FL classes is a necessity and is motivated by the fact that it provides for the effective organization of individual and group work of students in class (Alkhezzi & Al-Dousari, 2016), improves practical skills and abilities (Vo & Vo, 2020), raises interest in FL classes (Gangaiamaran & Pasupathi, 2017), activates students' cognitive activity (Ozer & Kılıç, 2018), and modernizes practical lessons (Ta'amneh, 2020).

Employment of advanced smart technologies (webinars, blogs, Twitter accounts, and video and audio podcasts) in asynchronous and online modes in the process of teaching an FL increasingly complements traditional teaching methods that help form the communicative core (from awareness of the possibility to express thoughts in another language to the skills and abilities to solve communicative and cognitive problems independently) (Ebadi & Bashir, 2021) and allows a student take a different look at FL learning, thereby uncovering their intellectual and creative potential (Hidayati & Endayani, 2019; Li & Wang, 2023).

The analysis of relevant scientific sources evidences the lack of accumulated experience and a need for empirical research in this problem area. In this relation, we assert the need to investigate opportunities for the practical implementation of smart devices in the process of teaching an FL to economics students to raise their proficiency level to B2.

The goal of this paper is to define the degree of efficiency of using smart services in FL learning.

To achieve this goal, we set the following research objectives:

- 1) to substantiate the use of smart devices in the process of FL teaching as a pedagogical condition for the formation of FL competency;
- 2) to experimentally test the efficiency of introducing smart devices in the process of forming FL competency;
- 3) to conclude from the results of the study and establish the advantages of introducing smart devices into the formation of FL competency.

The research hypothesis put forward is that the efficiency of the formation of FL competency in economics students at a university will improve due to the introduction of smart devices in the FL teaching process.

### III. METHODS

Experimental testing of the efficiency of implementing smart devices in the formation of FL competency in economics students was conducted based on a university in the academic year 2021-2022. The study was conducted in experimental and control groups of 1st-year students with the same composition and initial level of FL competency. A total of 195 students took part in the formative experiment (97 in the experimental (EG) and 98 in the control (CG) groups).

### IV. EXPERIMENT STAGES

The experimental study was organized in three stages. Stage-by-stage implementation of the formation of the FL competency involved the actualization and enhancement of basic linguocultural and socio-cultural knowledge and skills in the FL environment using smart devices.

The first (ascertaining) stage involved initial control of the level of FL competency, which consisted of vocabulary and grammar tests.

In the second (formative) stage, students in the EG underwent training using smart devices, which took place in two sub-stages:

- stimulation-motivational (building motivation for the experimental conditions of the use of smart devices);
- activity (classroom and extracurricular work using smart devices).

In the third (control) stage, we performed the final control of the level of FL competency and compared the results to the levels recorded before the formative stage. The final control consisted of vocabulary and grammar tests (with answer options), a written essay on a topic, as well as the oral component – an interview on given questions.

### V. MATERIALS

The pedagogical condition for the formation of FL competency in economics students was defined as the use of smart devices in FL teaching. In the framework of using these devices, the learning process included authentic dialogues and tests in the FL, situational tasks for the organization of interactive interaction, and literary works from the country of the studied language. In particular, the tasks offered for better and faster learning of lexical units were: filling in the blanks, finding a match, understanding a word by definition, defining concepts, connecting words and pictures, connecting words and definitions, dividing words into groups in accordance with the topic, finding the right word by meaning, and many others. In addition, journalistic materials were used to form the FL competency of the students, justified by the fact that the materials contained information about the economic, political, and socio-cultural processes of the FL society.

In the process of applying smart devices to actualize students' knowledge, skills, and abilities, we employed such tools as an interactive whiteboard, tablets, and students' personal devices.

## VI. STATISTICAL PROCESSING

Statistical data processing was performed with Statistica 7.0 software. The nonparametric Pearson criterion ( $\chi^2$ ) was used to assess the reliability of the indicators in the groups. Criterion values and confidence intervals were calculated with the significance level set at  $\alpha = 0.05$ .

## VII. RESULTS AND DISCUSSION

The dynamics of the formation of the FL competency of economics students before and after the experiment are demonstrated in Table 1.

TABLE 1  
DYNAMICS OF FORMATION OF THE FL COMPETENCY OF ECONOMICS STUDENTS

Group	Stage	Proficiency level			
		A1	A2	B1	B2
EG	before the formative experiment	47.2%	32.5%	13.1%	7.2%
	after the formative experiment	21.7%	35.3%	28.2%	14.8%
CG	before the formative experiment	44.2%	37.7%	12.2%	5.9%
	after the formative experiment	40.2%	39.4%	14.1%	6.3%

Table 1 shows the indicators that attest to the effectiveness of the proposed methodology. In the EG, progress in mastering FL competency based on the results of the formative experiment is demonstrated by a higher percentage of students than in the CG.

The results of the ascertaining stage of the experiment show a low level of FL competency among the participants. Most of the students in both the EG and CG demonstrated FL proficiency at the A1 and A2 levels.

In turn, the results of the control stage indicate an increase in the levels of FL competency in the EG. Based on values observed in the CG and EG, we can conclude that the implementation of smart devices in teaching an FL to students is effective and expedient.

After the formative experiment, according to the Pearson  $\chi^2$  criterion, we mark a positive effect of smart device implementation in the work with EG students, showing a significant improvement in the level of their FL competency. This can be seen from the levels of manifestation of FL competency in EG students before and after the formative experiment, which differ sufficiently, allowing us to speak about the effectiveness of smart devices and consider the research hypothesis confirmed.

The empirical value of  $\chi^2$  (66.29) falls in the significance interval and considerably surpasses its critical value with the significance level  $p < 0.001$ . Accordingly, the validity of the hypothesis can be argued to be significant, meaning that the use of smart devices is a significant factor influencing the formation of FL competency in the EG. Thus, the value of  $\chi^2$  (66.29) confirms the statistical significance of differences between the CG and EG in the results of FL competency testing.

The value of  $\chi^2$  (43.61) suggests that the difference between before and after the formative experiment in the EG is also significant.

In contrast, the results of the calculation of  $\chi^2$  (1.18) do not confirm a statistically significant difference between the levels of CG students' FL competency before and after the formative experiment.

Thus, the introduction of smart devices in the formation of the FL competency of economics students proves to be significant and efficient, as demonstrated by our statistical results.

The language material presented via interactive technology allowed students to trace certain patterns in several linguistic phenomena, discover the common and the differences in their composition, and purposefully repeat the previously studied material and systematize and summarize it, which is necessary for a deeper perception and assimilation of new knowledge.

The research results prove the expedience and efficiency of introducing smart devices into FL teaching to form the FL competency of economics students. The implementation of these devices in the university educational process brought a positive change in the level of FL competency in the EG. The results observed in the CG show that the traditional vocational training without the application of smart devices is not contributing to the development of FL competency enough.

In the context of forming the creativity of university students, the forms and methods of modern FL classes have changed. The main goal of teaching an FL is to form students' communicative competency, i.e. to have students master the language as a means of intercultural communication and develop the ability to use language as a tool in the dialogue of cultures (Solovyova et al., 2022). The formation of FL communicative competency in FL teaching is facilitated by the use of smart technology, which improves students' concentration and the speed of absorption of learning material, resulting in better performance of each student (Alwraikat, 2017; Sergeeva et al., 2021).

The development and use of smart technologies in FL teaching bring the quality of education to a new level that corresponds to the current and future needs of society for qualified specialists (Vo & Vo, 2020). The advantages of smart technologies are that they are capable of fostering students' creative abilities, professional knowledge, communication skills, and ICT literacy. They build critical thinking and innovative approaches to professional problems and perfect the skills of effective cooperation, mutual understanding, leadership, and career development (Borodina et al., 2021; Casey et al., 2023; Ozer & Kılıç, 2018; Shishov et al., 2021; Tolmachev et al., 2022).

Thanks to the opportunities offered by smart technologies in FL teaching, the teacher can both use the available software resources and create their own interactive tasks of various types (individual and group) and levels of difficulty for students of different levels of training and specialties (Wang, 2017). Students do not simply work through FL learning material but collaborate, which ensures a lively experience for the class. For example, teachers can employ smart boards to reform the learning process, create an interactive atmosphere and communication environment, enable students to process large amounts of information, and create conditions for individual research work (Ta'amneh, 2020).

Today, it is difficult to imagine an FL class or preparation for it without the use of Internet resources that provide constant access to educational information and offer a unique opportunity to use authentic texts, listen to audio texts, and communicate with native speakers, that is, create a natural FL communicative environment.

## VIII. CONCLUSION

Owing to smart devices, the development of contemporary education enters a qualitatively new level in the training of specialists in various professions. Modern technologies of language learning make it accessible to anyone, without exception, who can master a certain level of knowledge with a small expenditure of time and material resources. For economics students, smart technologies give the opportunity to raise their language proficiency from beginner and elementary to intermediate and advanced and to improve the quality of FL skills required in the professional sphere.

Our experimental study proves the efficiency of implementing smart devices in the formation of FL competency of economics students. The use of smart devices in FL learning is found to contribute to the development of FL competency in economics students.

Among the limitations of the study, we can note the qualitative and quantitative limitations of the research sample and the duration of the experiment. The participation of only freshmen students in the experiment did not allow us to trace further dynamics of the improvement of FL competency. For this reason, prospective further research may focus on analyzing how the use of smart devices influences the formation of FL competency in senior years of study. Another prospect of further research on the use of smart devices in teaching a professionally oriented FL can be an analysis of the practice of application of professional dictionaries using smart devices in educational and translation activities to select the most effective of them.

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