The Use of Digital Technologies in Teaching Culture and Foreign Languages to Technical University Students

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Abstract- **The modern technological world is based on the interaction of professionals from different countries and cultures. To become full-fledged members of the global scientific, business and socio-cultural community, students of technical universities must not only acquire foreign languages of intercultural communication but also get an idea of the world culture in all its diversity. This study examines a technical university student's cultural and English language proficiency through a digital culture-related course for self-learning and flipped classroom activities. Culture is a complex and multi-faceted concept that may be challenging for students to attain fully. Thus, a variety of representative cultural elements was selected for the course, which is comprised of three modules supporting the formation of competencies in such cultural spheres as social interaction, spiritual culture, and science and technology. The course was digitalized using audiovisual translation and implemented at Kharkiv National Automobile and Highway University in the 2022–2024 academic years. To study the effectiveness of the course, an experiment was conducted with the aim, firstly, to identify how the level of educational autonomy changed in the two groups of students: those who studied the course using digital technologies (an experimental group) and those taught in a traditional format (a control group); and, secondly, to compare the level of assimilation of culture-related English language vocabulary in both groups. In this research, we applied both quantitative and qualitative methods to assess the results of the experimental work that proved the positive impact of the proposed approach on the student's linguistic and cultural competencies. The course contributes to raising intellectually, culturally, and multi-culturally developed citizens with a deep awareness of cultural values. It can be used as a template for creating innovative digital language learning resources.**

Keywords- audiovisual translation, culture, foreign language, technical university students.

INTRODUCTION

In modern societies, many professionals lead highly mobile ways of life. They often go abroad, and can work for long periods of time in other countries where there is a demand for their skills. This is a new category of people, so-called "citizens of the world", or people "beyond nations". Having knowledge of a foreign language in the widest cultural context is essential for such professionals.

The challenges of learning cultures and languages have become especially acute in recent times in the context of the "refugee crisis" in Europe, including that caused by the war in Ukraine. This current challenge is in addition to the inherent difficulties that immigrants face in adapting to new sociocultural environments.

In public debates and scientific discussions on immigration and migration for business or studies, cultural differences often occupy a central position as conflicts arise. Generally, attention is focused on finding ways to overcome obstacles that hinder acculturation as a process of the mutual influence of cultures, especially the perception of other people's cultures.

In its broadest form, cultural adaptation is understood as a process of "immersion" of an individual into a new culture, the incremental mastering of its values, norms, and patterns of behavior [1].

In today's reality the tight relationship between learning language and culture has become an axiom. In the contemporary context of globalization whereby many countries are no longer homogeneous, one must be ready to communicate with representatives of different cultures.

Multicultural societies abound throughout the world, however in order to become a full-fledged member of society, one must at least learn and tolerate – if not share – the values of other communities. Learning a foreign language is perhaps the most effective way of acculturation and adaptation to a new culture and its values.

However, at present cultural components in modern courses of foreign languages are vague and fragmented. Such courses certainly serve as an instrument of developing the learners' communicative competencies, as they teach vocabulary, grammar, form skills of speaking, reading, listening, and writing, but culture is often represented in a scattered, chaotic, and scant manner.

The lack of cultural components in foreign language classes contributes to the poor adaptation of some technical university graduates to other nations' values. It may also be a cause of low erudition, misinformed worldviews and lack of morality among university students.

We believe that a carefully designed, culturally rich foreign language educational course is necessary to enhance the skills required to navigate in a foreign land and culture. Such a course would increase the universality of cultural knowledge and values, and establish a baseline of core concepts that an educated prospective engineer should acquire.

Along with the selection of the culture-related content, an equally important task is the development of appropriate methods that would combine teaching languages and culture. The most modern of these methods are related to advanced information technologies.

At present, especially due to the development of mobile technologies, education is experiencing a widespread transition from synchronous methods of teaching in the classroom to asynchronous ones, which allow students to study in any place and at any time convenient for them in a distance learning format.

In fact, we are witnessing how the global education system is being reformed and modernized as information provided by video, sound, text, and other data are conveyed by digital languages [2].

As stated by Díaz Cintas and Massidda, the increasing ubiquity of technology, along with globalization processes have made possible the rapid spread of information and messages of cultural character [3].

The wide dissemination of cultural information through the use of audiovisual translation (AVT) started in cinematography about a hundred years ago, and since then has been gaining ground in other areas, including education, and, in particular, teaching foreign languages (FL) [4]. The increasing availability and affordance of technology allow audiovisual products to be rapidly disseminated through television, computer, smartphones, tablets and any other digital devices equipped with a screen.

According to Chaume, AVT as an academic term includes both traditional and state-of-the-art linguistic and semiotic forms like subtitling, dubbing, respeaking, audio-subtitling, voice-over, and fansubbing [5].

ATV is a kind of translation that involves the transfer of audiovisual texts either interlineally or interlingually. It involves the use of a multimedia electronic system for conveying messages, and an audiovisual text is created using such semiotic means as speech, image, music, etc., which are combined together to be shown on the screen. As follows from the name of this type of translation, it simultaneously affects two channels of communication: acoustic, through which verbal and paralinguistic information is transmitted; and visual, through which the perception of images and linguistic signs occurs.

Currently, audiovisual resources are a significant cumulative bank of materials for teaching foreign languages, which contains rich linguistic and cultural information [6].

At the same time the considerable potential of AVT in learning languages and cultures needs further exploration.

This research is aimed at

1) the substantiation of the relevance of culture in a foreign language education and assimilation of multiple aspects of culture in an adaptive learning course;

2) the development, digitalization (using audiovisual translation), and implementation of the course comprising modules that support the formation of competencies in various cultural spheres;

3) the study of the impact of the audiovisual course on the level of students' mastering the culture-related vocabulary and their autonomy in learning languages and culture.

MATERIALS AND METHODS

The effects of teaching FL and culture via AVT were compared with the results of a traditional in-person format in teaching English as a FL at the Department of Foreign Languages at Kharkiv National Automobile and Highway University.

Using a randomization selection process, an experimental group (EG) of 53 people and a control group (CG) of 54 people were gathered, both groups being nearly equal in terms of gender and age. The EG students studied a foreign language (English) course using the technology of learning language and culture via AVT. They were exposed to both in-class and out-of-class instructional materials, including mini audio-visual files uploaded on YouTube. The control group students were exposed to in-person class activities and instructional materials in a printed format. The participants of the study had one 90 minutes class per week during the 2022 – 2024 academic years.

To determine the cultural components to be taught in a foreign language course, we considered several views on the concept of culture and decided what it means to us.

The problem is that despite numerous attempts to come to a common understanding and interpretation of the concept of culture, there is no single commonly accepted definition [7], as culture is an all-embracing concept which can cover a great diversity of phenomena, from universal values to peculiar cultural expressions [8].

Culture is a complex and multi-faceted concept that is extraordinarily challenging for students to assimilate completely, so a careful selection of cultural elements that represent culture in its entire structural completeness was needed.

To determine the elements of culture to be selected for our course we used a model of culture which included three subsystems pointed out by Leavitt: technological, sociological, and ideological [9].

In our case technological culture is the use of scientific knowledge to solve practical engineering problems; sociological culture is associated with the sphere of communication, in which we distinguished day-to-day social interactions and cross-cultural communication; ideological culture was treated as spiritual culture that includes arts and humanities.

Then, we specified the structure and the volume of cultural knowledge to be taught to students in a foreign language and developed a special three-module course aimed at familiarizing the learners with many significant cultural achievements and a cultural treasury that comprises:

1) social interaction;

2) spiritual heritage (including Historical periodization, modern history, World Wars, contemporary history, world economy, state, election, politics, world religions, art, painting, sculpture, music, literature, cinema, education, science, traditions, language, sport etc.);

3) science and technology.

Each module was divided into units that were presented in an audiovisual format and placed on YouTube as separate audiovisual files (we developed and placed about 200 videos), each lasting 20–25 minutes [10], and that were also available in a printed format.

The novelty and distinctive feature of this approach is that in the design of the course we extensively used a learner's mother tongue (MT) in contradiction to the use of only a FL, as proposed by Butzkamm and Caldwell [11].

For many years, a student's native language has been ignored as a resource in FL learning, and in some contexts has even been banned. However, this policy is not followed by most teachers, and the arguments for excluding the native language are not supported by research [12], [13].

The learner's own language has been "treated as a pariah" in almost all modern language teaching theories [14]. The approach "no MT, no printed word, as little "drill" as necessary, and, hopefully, instant participation in "real-life" activities is a recipe for submersion, not immersion" that calls for a fundamental rethinking of the FL methodology [11].

Krashen's Comprehension Hypothesis [15] states that we acquire language when we understand messages, when we understand what people tell us, and when we understand what we read. According to this Hypothesis the first language helps to make input more comprehensible as you can banish the learners' native language from the classroom, but you cannot banish it from their heads since it always dominates their minds.

The translingual or translanguage teaching, which means the switching from one language to another, is relatively new in education. It is an educational

technology that provides for the use of the learners' knowledge, skills and experience acquired in their MT for FL acquisition. As some authors state, this term also describes a language practice that involves a deliberate alternation between the language of input and output in the classroom [16].

In our course design, we used elements of translanguaging in the form of parallel translation when students were provided with bilingual recorded texts placed on the screen for out-of-class self-study.

The method of parallel translation whose efficiency is so far underestimated, have been used by almost all polyglots, i.e. people who manage to learn numerous languages by themselves [17].

Then the material was supposed to be drilled. Some methodologists are still skeptical about drilling though this method has been used by foreign language teachers for many years and, despite accusations of some monotony, has proven its efficiency, especially at the initial stages of language learning. The essence of the method lies in the multiple repeating of structures in order to bring them to automatism.

In our case, drilling provided students with intensive listening and speaking practice, presented correct pronunciation patterns; while repeating the words after the speaker on the video, and then listening to the model, the students immediately received feedback and could analyse their mistakes; and, perhaps most importantly, they got the opportunity to independently listen to and study the language material in a volume and at a pace appropriate for each individual student, which created a safe learning environment, allowed learners to feel secure and confident, thus making drilling an invaluable assistant in the memorization and atomization of language patterns [18].

So, the students imitate words and phrases they can hear and see, they repeat them as many times as necessary for sound memorization, thus independently honing phonetic and speaking skills and saving time for performing creative and problem tasks in the classroom.

When the material has been drilled by students on their own, it becomes possible to break away from the fixed text and use the new skills in practice. During off-line or on-line classes with a group, the self-learned material was used in new contexts interesting and useful for students. Our approach falls under the definition of the flipped classroom, i.e. a phenomenon that has become an integral part of blended learning due to the continuous digitalization of education.

As modern technologies develop, flipped learning is becoming increasingly popular in various fields of education, including foreign language teaching. This approach reverses the traditional components of the educational process, that means that students independently prepare the material before coming to class, by watching and listening to videos recorded by the teacher or downloaded from the Internet in a ready form, and class time is devoted to the practical use of the material and solving higher-order problems to consolidate knowledge [19].

This is fundamentally different from the traditional approach, in which students first watch a video in the classroom, then the content comprehension is checked, and only then a discussion is organized. It is natural that, firstly, there is much less time left for discussion than in case of the flipped classroom, and, secondly, there are always students who do not manage to "catch" the material of the video from the first attempt in the classroom and they simply fall out of the educational process.

RESULTS AND DISCUSSION

The effectiveness of the proposed approach was assessed by such criteria as

1) students' autonomy in learning;

2) assimilation of culture-related vocabulary.

The criterion of autonomy in learning characterizes the focus of students on self-education and self-improvement in the field of language and culture studies, with such levels as autonomous, dependent, and indeterminate.

The so-called "autonomous" students are focused on self-education and self-development. They are characterized by a high degree of independence, showing such qualities as persistence, purposefulness, self-directedness, self-control, self-confidence, aspiration to work on their own. The "dependent" students are characterized by near absence of such qualities, and their educational activities mainly rely on their instructors and external incentives. "Indeterminate" students cannot be classified with certainty as being "autonomous" or "dependent", because they have approximately equally pronounced features of both types.

To diagnose the level of autonomy in order to place the students in one of the three groups, they were asked to answer the items of the questionnaire [20] though adapted to our purposes.

The questionnaire for identifying the style of learning consisted of 18 statements with which the testee might agree (+) or disagree (-). Students who scored 11 or above could be classified as "autonomous", while those who scored 7 or below could be classified as "dependent". Students with the score of 8, 9, 10 points were classified as "indeterminate".

We used a Likert scale which provided a range of responses to the question to what extent the students needed external stimula to study culture in the foreign

language via AVT. Additionally, we used the open-ended question which we consider a very attractive tool to provide a sincere and honest personal comment: please, indicate areas for improvement in the teaching of FL and culture with the use of audiovisual technologies.

The data shown in Table I demonstrate to what extent the described approach affected the students' autonomy in learning which is considered a very desired result of education.

TABLE I TRENDS IN THE DEVELOPMENT OF LEARNING AUTONOMY (%)

The learning style	Group			
	E (53)		C (54)	
	Before experiment	After experiment	Ascertaining data	Control data
Autonomous	43.5	72.4	45.0	57.7
Dependent	41.3	17.0	44.3	31.2
Indeterminate	15.2	10.6	10.7	11.1

During the second academic year under consideration, when the students were more or less prepared for events held in English beyond the classroom, they were quite regularly involved in various kinds of cultural practices in the English language, namely: contests of students' essays, round tables, conferences, contests for the best translation of English prose and poetry, an English language Olympiad at the University and beyond.

The dynamics in the number of participating students from both, the EG and CG groups, presented in Fig. 1. clearly shows a much greater percentage of the EG students involved in these events.
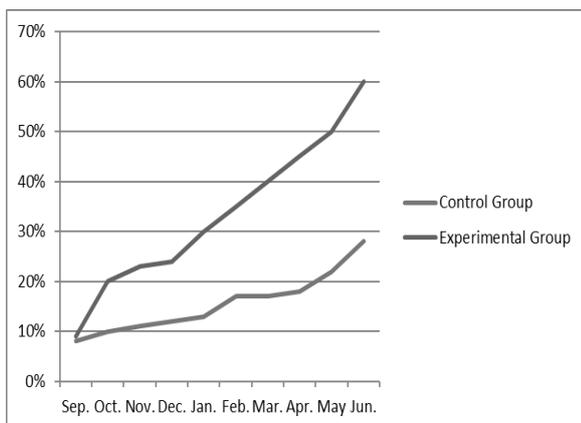

Fig. 1. Dynamics of the students' involvement in cultural activities.

A second criterion of efficiency of learning language and culture was the level of vocabulary assimilation.

High correlations between vocabulary assimilation and other parameters of foreign language knowledge and skills were found long ago. A large vocabulary is undoubtedly considered one of the most important indicators of developed foreign language communicative competence.

Students were given a performance test consisting of a pre-test and post-test developed on the basis of the course content. This was used to evaluate the learners' proficiency in using culture-related vocabulary.

The pre-test and post-test consisted of multiple-choice questions, fill-in-the-blank items, true-false questions and sentences to write using provided words.

We also monitored changes in vocabulary using a complementing technique. Students were given samples of texts with missing culture-related words and were asked to fill the gaps. Some examples of tests to the module "Spiritual heritage" are given below.

(Unit: The 21st century)
Fill in the text with appropriate words from the list:
a) renewable sources of energy;
b) dwindling;
c) uprisings;
d) nuclear energy;
e) integration;
f) changes;
g) threats.

The 21st century has been marked by growing economic globalization and (1)… . Expansion of communications with mobile phones and the Internet has caused fundamental (2)… in business, politics, and individuals' personal lives. The Arab Spring, a revolutionary wave of (3)… in Africa and Asia led to a resurgence of authoritarianism and the advent of reactionary groups like the Islamic State. A need for safe, reliable energy supplies has spurred the development of (4)…, chiefly solar and wind energy, in place of the (5) … and carbon-based energy. So far the century has seen many global (6)… including nuclear proliferation, global climate change, air and water pollution, deforestation, overpopulation, the (7)… of natural resources worldwide.

(Unit: Election)
Choose the correct answer to the following question:
Why is the secret ballot considered crucial in most free and fair elections?
a) It limits the effectiveness of intimidation.
b) It increases openness and accountability.
c) It gives people the right to select their own government.

(Unit: Religion)
Match the halves of the sentences:

1. A religion is a set of beliefs	a. or certain times of a person's life.
2. In many religions, one of the main beliefs is that	b. synagogues.
3. In each religion people often have rituals for certain times of the year	c. mosques.
4. In Judaism, temples are called	d. churches
5. In Christianity, they are called	e. that is passionately held by a group of people.
6. In Islam, they are called	f. are called agnostics
7. People who say that there is no evidence of god	g. there is a "deity" (or god) who is a great creator spirit

(Unit: Sculpture)
Answer the questions:
1. What materials are considered traditional for sculpture?
2. What are the major techniques in sculpture?
3. What material for sculpture survives better than others?
4. What are the most famous statues in the history of sculpture? etc.

The measurements were carried out on an ordinal scale with L gradations. In our case, three levels of knowledge were identified (L = 3): low (knowledge of only certain concepts related to culture; the number of completed tasks is less than 60 %), medium (limited knowledge of vocabulary; the number of completed tasks is 60 – 74 %), high (students are fluent in concepts, lexical units and phrases in different socio-cultural areas; the number of completed tasks is more than 75 %).

The results presented in Fig. 2, show that in the experimental group where culture-related vocabulary was learnt via AVT, the indicators are much higher than those in the groups, where the technology was not used.
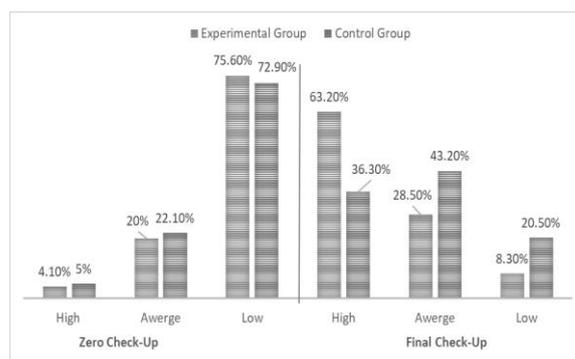

Fig. 2. Culture-related vocabulary assimilation rates

The data analysis tools had a software implementation in the form of a computer program "Statistics in Pedagogy", which showed more prominent positive changes in the statistical data of the experimental group compared to the control sample by the test of significance [21].

Thus, the effectiveness of the developed approach is demonstrated by a significant positive change in the autonomy of the EG students and the quality of their culture-related vocabulary.

We fully agree with the authors [3] that different forms of audiovisual translation products continue to cross linguistic borders, having more and more influence on viewers.

This type of a bilingual course can be developed for learning any language. The most important result is that the cultural content is developed to be used in variations with any other languages depending on the demand of learners and market. This approach can be especially useful for the countries that have to deal with the issues of large-scale immigration and/or receiving many international students, as it offers people opportunities to learn languages in a wide cultural context on their own.

Our approach proposes the following innovative elements. The first innovative element is the integrated learning of language and culture, whereby culture includes thoroughly selected cultural components (as opposed to the chaotic representation of cultures that currently appears in modern text-books).

The second innovative element consists of utilising the MT in acquiring the FL. The third innovative element is the use of AVT for learners outside educational institutions to enhance their language proficiency.

The flipped classroom approach facilitates language acquisition by providing students with an unlimited access to electronic resources and helps them become autonomous learners, free from the constraints of social

situations. In modern literature, this is called adaptive learning.

There is a growing global recognition that a one-size-fits-all approach to learning is not sufficient to meet the needs of students or society as a whole. To address this problem, many countries such as Australia, Canada, Denmark, France, Germany, the UK, New Zealand and the US are increasingly turning to personalized learning to meet the diverse needs of students.

While there are many definitions of this new phenomenon, personalized learning is generally viewed as an educational approach in which the learning experience is customized to each student to meet their needs and to take into account their strengths, skills, experiences and interests [22].

The purpose of the adaptive technology in the higher education is to teach students to independently acquire knowledge with maximum adaptation of learning to the individual characteristics of students.

Adaptive personalized learning expands educational opportunities for students without significant material costs. This technology promises to make high-quality, low-cost education available to an unlimited number of people.

Modern advances in information technology and cognitive psychology have led to the development of adaptive learning systems that allow FL learners to increase their vocabulary and improve their language skills more effectively. A variety of adaptive models and applications are being developed that use software to teach vocabulary and pronunciation in real time with assessment of the accuracy of students' pronunciation [23].

A new stage in the development of adaptive technologies for language learning has started with the emergence of mobile learning tools which makes education available anywhere and at any time. The peculiarity of mobile devices is the ease of use, reasonable price for students and the ability to communicate via the Internet or mobile networks, which contributes to the emergence and development of various FL teaching methods [24].

The development of an autonomous learner is, of course, the aim of all educators – not to produce masters but to allow people to improve their education and to continue to grow intellectually.

The described course is only one example of several opportunities for language acquisition that AVT offers. The limitation of the proposed method is that it can only be used in monolingual classes where the entire group of students are native speakers of the same mother tongue. However, such classes are commonplace in the traditional education system of most countries, so

anywhere in the world any teacher can use the already developed cultural content in English for their students, no matter what language they speak.

CONCLUSIONS

We believe that AVT has a big potential for teaching foreign languages and culture though needs to be further explored.

As Chaume puts it, the inventory of audiovisual translation modes is in no case closed, and indeed it is bound to grow and change as new audiovisual formats, and technological advances and audience tastes evolve and change [4]. As educators, we must also evolve and change alongside the new technologies that emerge.

Undoubtedly, it is imperative for foreigners who choose to work or study abroad, immigrate or establish business contacts with locals to at least learn the cultural values of another country, if not adopt them. Learning a foreign language can be a powerful practical instrument of assimilation.

As it may be challenging for students to fully learn a complex and multi-faceted concept such as culture, we developed, digitalized, and implemented a special bilingual course aimed at familiarizing students with important cultural achievements and cultural treasures of the world. The course comprises three modules that support the development of competences in various areas of culture: social interaction; spiritual heritage, and science and technology.

The distinctive feature of this course consists of utilizing the potential of the mother tongue and ATV in acquiring a foreign language. This course has proved to be effective for distance learning during the Covid-19 quarantine and, most importantly, a wartime period in Ukraine. It can be used as a template for developing bilingual courses for learning any language.

Our research reveals that doing so not only improves university students' language proficiency, but also contributes to raising intellectually, culturally, and multi-culturally developed citizens with a deep awareness of cultural values. This study proves that despite challenges, using AVT in teaching foreign languages and culture had significant positive effects on students' language competence, problem-solving skills, critical thinking, and learning motivation.

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