ONLINE RESOURCES AND SOFTWARE FOR TEACHING AND LEARNING LATIN

RECURSOS ONLINE E SOFTWARE PARA ENSINAR E APRENDER LATIM

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ABSTRACT: The aim of this article is to review electronic resources in Latin, analyzing their didactic potential to help Classical teachers to effectively organize the educational process, diversifying the set of tools, and enhancing their work. Today, most of the useful links are accumulated on domestic professional sites devoted to the study of Latin. Many foreign scientists and teachers simply do not know about their existence. From time to time, attempts are made to summarize information and provide content for studying Classic languages in scientific publications, but such information quickly becomes outdated and needs to be regularly updated. This article provides an overview of the current most popular resources on Latin: digital libraries and databases, online courses, electronic textbooks, dictionary, translators etc.; describing the current state of the development of e-learning tools and websites for the study of Latin in Ukraine.
KEYWORDS: electronic educational resources; online resources; language learning; Latin language.

RESUMO: O objetivo do artigo é revisar recursos eletrônicos em Latim, analisando seu potencial didático para ajudar os professores clássicos a organizar efetivamente o processo educacional, diversificando o conjunto de ferramentas e aprimorando o seu trabalho. Hoje, a maioria dos *links* úteis é acumulada em vários *sites* domésticos dedicados ao estudo do Latim. Muitos cientistas e professores estrangeiros simplesmente não sabem sobre sua existência. De tempos em tempos, são feitas tentativas de resumir informações e fornecer conteúdo para o estudo de línguas clássicas em publicações científicas, mas essas informações rapidamente ficam desatualizadas e precisam ser atualizadas regularmente. Este artigo fornece uma visão geral dos recursos mais populares da atualidade em Latim: bibliotecas digitais e bancos de dados, cursos *online*, livros eletrônicos, dicionário, tradutores etc.; descreve o estado atual de desenvolvimento das ferramentas de *e-learning* e *sites* para o estudo do Latim na Ucrânia.
PALAVRAS-CHAVE: recursos educacionais eletrônicos; recursos *online*; aprendizagem de línguas; língua latina.

1 Introduction

In 2006, with the support of the European Commission, the *CIRCE* (Classics and ICT Resource Course for Europe) project was launched; it combines the efforts of European scholars and teachers to develop effective methods for using ICTs in Classic languages teaching. As the authors of the project emphasize, traditional methods of teaching Latin and Greek should be revised in the 21st century. The goal of the project is

to support and provide Classical teachers with effective methods for using computer technology in the learning process. Within the framework of the project, the manual for teachers containing generalization and systematization of best practices in this field, theoretical and practical advice on the use of existing and the creation of new electronic resources for the study of Latin, as well as the results of research in this area have been published in six languages (MORGAN, 2006).

The website *CIRCE* (http://www.circe.be/) offers a list of web resources for teaching and learning Latin and Greek such as *The Classical Art Research Centre database of University of Oxford, Cambridge museum of Classical archaeology database, Packard Humanities Institute, Greek Inscriptions, Fitzwilliam Museum Online Collections Database, Ashmolean Museum Online Collections Database, British Museum Online Collections Database Chiron* (CC images of the classical world), *The Digital Classicist* (advanced digital methods applied to the study of the ancient world), *Perseus Latin word study tool, The Latin Quarter* (allow hearing Latin read aloud, access online supports for The Complete Latin Course, watch films with Latin spoken)*, Classics stuff* (line-by-line vocabulary lists for classical texts)*, Pelagios Digital Map of the Roman Empire* (interactive map of the ancient world) etc.

However, in the post-Soviet countries (including Ukraine) the development of electronic content for learning Latin is gaining momentum, but already has a certain experience, not covered in this project as well as the experience of American, Asian, Australian teachers. Most of the useful links are accumulated on several domestic sites devoted to the study of Latin. Many foreign scientists and teachers simply do not know about their existence. From time to time, attempts are made to summarize information and provide content for studying classical languages in scientific publications (BALALAIEVA, 2014; HARDWICK, 2000; HINKE, 2009; HUNT, 2018; LISTER; SMITH, 2001; LISTER, 2007; MAHONEY, 2001; PANTELIA, 1995; REINHARD, 2012), but such information quickly becomes outdated and needs to be regularly updated. There is a shortage of scientific works of a general character, in which information on this issue is systematized.

The aim of this article is to review electronic resources in Latin, analyzing their didactic potential to help Classical teachers to effectively organize the educational process, diversifying the set of tools, and enhancing their work.

Since there are no unified criteria for evaluating resources for teaching and learning Latin, in selecting resources we have been guided by criteria, which were developed based on CARS checklist for evaluating Internet research sources (HARRIS, 1997), Adaptable usability heuristic checklist for online courses (DRINGUS; COHEN, 2005), and Criteria for selection of educational materials used in foreign language teaching (KORSAKOVA, 2014).

According to the aim of this article, 10 criteria were established, as follows: credibility, accuracy, reasonableness, support, interactivity, aesthetics, accessibility, communicative value, pragmatic value, and cognitive value. A pilot survey was conducted in a representative group (n=9). 9 Classical teachers of the National University of Life and Environmental Sciences of Ukraine were offered to rate 60 online resources on these criteria on a five-point scale: 1 – very low, 2 – low, 3 – medium, 4 – high, 5 – very high. The results of the survey are given in Appendix 1.

2 E-libraries and databases

Such resources as e-libraries and databases were highly rated by criteria of credibility and accuracy. Most of them are well-designed and well-supported. But because of their specific nature, they have low interactivity, communicative and pragmatic value, and often are not accessible for a wide range of users.

One of the best e-libraries is *Perseus Digital Library,* Tufts University (http://www.perseus.tufts.edu/hopper/), which has the largest database of Latin and Greek stuff, consisting of texts (original language, translations) and images. The digital collection contains about 4 million Latin materials, over 64 thousand images and presentations, but the most important characteristics of the library are the rational structuring of materials and database architecture.

The huge resources of the original antique and medieval texts are offered by *TLG – Thesaurus Linguae Graecae: Greek Texts* (http://stephanus.tlg.uci.edu/), *PHI5 – Packard Humanities Institute: Latin Texts and Bible Versions* (https://latin.packhum.org/), *BTL – Bibliotheca Teubneriana Latina* and *TLL – Thesaurus Linguae Latinae* (https://www.degruyter.com/view/db/btltll).

Brepolis, or *Brepols' Online Databases* (http://www.brepolis.net/) consist of 4 parts: *Source Collection (Brepolis Latin: Library of Latin Texts, Archive of Celtic-Latin Literature, Aristoteles Latinus Database, Patrologia Orientalis, Database of Latin Dictionaries, Dictionary of Medieval Latin from British Sources), Stand-alone Database (Vetus Latina Database), Bibliographies and Encyclopaedias.*

A part of the *Forum Romanum* (D. Camden, Harvard) – *Corpus Scriptorum Latinorum* (http://www.forumromanum.org/literature/) – contains a digital library from the earliest epigraphic writings to the Neo-Latinists works of the 18th century, which is distinguished not only by the large volume of Latin sources but also by a convenient search engine (by author, title, year, genre).

The project *Libellus,* University of Washington (http://www.hhhh.org/perseant/libellus/) provides a library of classical Latin and Greek texts with minimal redistribution restrictions.

Bibliotheca Latina IntraText, Èulogos SpA (http://www.intratext.com/LATINA/) is a full-text digital library offering books and corpora as lexical hypertexts on Creative Commons License, under headings *Latinitas Romana* (antiqua, classica, postclassica), *Latinitas Mediaevalis* and *Latinitas Nova*.

An analytic bibliography of online Neo-Latin texts (http://www.philological.bham.ac.uk/bibliography/index.htm) contains 63,210 entries on Latin texts written during the Renaissance and later that are freely available on the Web.

The platform *Textkit* (https://www.textkit.com/) provides free of charge downloads of Greek and Latin grammars, readers, lexicons and dictionaries, offers a large library of over 180 of the best Greek and Latin textbooks, for instance, *Latin for Beginners* (D'Oogle's), *Beginner's Latin Book* (Collar and Daniell), *A Latin Grammar* (Charles E. Bennett), *New Latin Grammar* (Allen & Greenough), etc.

3 Online courses, software, e-textbooks, tutorials

Users are also offered several courses for learning Latin online and offline. One of the most famous Latin courses for beginners is the *Cambridge Latin Course*, which has proved effective in teaching practice for over 50 years. Besides the traditional printed edition, this course is now available online (https://www.cambridgescp.com/) and on DVD. Under a project approved by the British government, *Cambridge Latin Course E-Learning Resources*, which contains selected texts, video, and audio materials, was created to raise the standards of learning Latin and provide greater access to this subject.

This course is highly evaluated in all 10 criteria and holds a leading position in rating, as well as another popular university course – *Oxford Latin Course: Online* (http://www.umsl.edu/~phillipsm/oldrills/index.html).

One more authoritative textbook for beginners with a good track record and more than 60 years of practice of using in American schools is the *Wheelock's Latin*, which continues to exist on the *Official Wheelock's Latin Series Website* (http://wheelockslatin.com/). The site provides all materials based on this manual: audio files, workbooks, flashcards, drill-and-practice programs *Latin Vocab Drill 4.0 and Latin Flash Drill 4.0,* etc.

The *Rosetta Stone Latin course* (https://www.rosettastone.com/learn-latin/) is a multimedia program for learning Latin from a zero level. The training uses a flash technique with a combination of text, image, and sound so that the user intuitively memorizes the words from which phrases and sentences are built in a systematic progression. Such kinds of speech activity, like listening, reading, speaking are used in the lessons. The technology developed by the company is called Dynamic Immersion, which involves learning the language through multiple repetitions and the formation of associative series on several topics. This technique teaches to perceive and automatically reproduce the most common speech constructs.

The multimedia product *Lingva Latina per se illvstrata* by Hans H. Ørberg (https://lingualatina.dk/wp/) is designed for learning Latin via the natural or direct method, that encourages students to learn Latin without resorting to translation. It consists of two parts: *Familia Romana* (main course) and *Roma Aeterna* (additional course) and contains DjVu textbooks, their parts in the author's reading in mp3 format, interactive grammar exercises, additional texts collection, Latin-English dictionary.

An interactive Latin course for beginners *Latinum Electronicum* (https://www.degruyter.com/view/db/latinummi) was developed within the framework of the Swiss Virtual Campus project, which aims to develop modules that incorporate distance learning courses through the active use of information technology in the higher education system. The course is presented in three languages – German, French, Italian.

The *Latein Online* (https://www.scioviam.de/) contains an electronic Latin course, developed within the framework of the Studierplatz Sprachen project. The general self-study course consists of three consecutive modules with control tasks and texts. The modules correspond to the structure of the Latin course in many German universities, so the transition from an online course to university and the other way around is possible.

The website *Latin Teaching Materials at Saint Louis University* (https://www.slu.edu/colleges/AS/languages/classical/latin/tchmat/tchmat.html) has been

operating for 12 years. Besides SLU Classical Program Information it contains set of Latin e-books for Kindle and other devices, *Grammar and Vocabulary Helps*, which presents the essentials of beginning and intermediate Latin morphology, *Latin Praxis* – series of exercises and Explanation Pages, *Verbal Brilliance in Latin* – set of handouts in pdf format, *Rudimenta in Motu* (Flash movies), *Timelines for Roman History, Reading Acceleration Machine* – a tachistoscope that supports efficient and rhythmic reading, rehearsal of text-comprehension, and acceleration in reading speed.

The platform *Latinitium* (https://www.latinitium.com/) is for anyone wanting to learn to read and speak Latin, contains audio/video podcasts in Latin, articles on learning Latin, several resources, from texts to online dictionaries.

The *Carmenta Online Latin* (http://www.carmentalatin.com/) offers Latin Course, curricula for the SAT® Latin Subject Test or AP® Latin Exam, or individual curriculum through one-on-one skype instruction with teachers.

Transparent Language (https://www.transparent.com/) proposes a two-level Latin course, each level has 8 units, including 3-5 vocabulary lessons (accompanied by images and sounds) and 1 grammar lesson (accompanied by additional instructions and drills on topics).

A well-organized and comprehensive tutorial *Latin Online* https://lrc.la.utexas.edu/eieol/latol is proposed by The Linguistics Research Center at the University of Texas at Austin.

The *Power-Glide Latin Ultimate* (http://www.lexiconer.com/power-glide/power-glide-latin-ultimate-course.html) proposes 2-year courses for learners 7th-12th grade and adult. Activities in the course are diverse enough to accommodate many learning styles using music, stories, memory aids, diglot weaves, kinesthetic, visual, audio activities, and more.

Medieval Latin by UK National Archives (http://www.nationalarchives.gov.uk/latin/) is a two-stage beginners' guide to medieval Latin.

Among the well-known courses we should also point out: *Ecce Romani* (https://people.umass.edu/~glawall/ecceroma.html), *Evan der Millner's Latin Language Course* (https://sites.google.com/site/janualinguae/), *Linney's Latin Class* (http://www.linneyslatinclass.com/), *Mundus Latinus* (http://info.munduslatinus.de/), *Schola Latina Europaea & Úniversalis* (http://avitus.alcuinus.net/schola_latina/), *KET's Distance Learning Latin Program,* Kentucky Educational Television (https://www.ket.org/making-a-difference/distance-learning), *Latin pour debutant* (https://www.prima-elementa.fr/Latin-01.html).

In learning Latin, algorithmic learning activities, such as developing abilities and skills on the definition of the type of syntactic construction, the translation of the word/term is very important. Some students need more training, repetitions and checking for the correct execution of these actions than a teacher can provide in the classroom face-to-face studies, while interactive guides and manuals are able to provide such an opportunity. There are numerous resources available on the Internet which include tests on and exercises of varying difficulty levels to test grammar and translation skills, for example, *Latin Flash Drill 5.0* and *Latin Vocab Drill 5.0,* Centaur Systems (https://www.centaursystems.com/default.html), *Latin Games and Learning, Latin Product Quizzes*, based on *Transparent Language's LatinNow! Program* (https://www.transparent.com/learn-latin/quizzes/now-quizzes/), *Lingua Latina/WinLatin*

(https://archive.org/details/MEDLEY_SE120003), *Latin Trivia and Quizzes* (https://www.funtrivia.com/quizzes/world/languages/latin.html), *Nugae Latinae* (http://www.users.globalnet.co.uk/~loxias/caecilius/nugae.htm), *Interactive Vocabulary and Grammar quizzes, LatinTest.net* (http://latintests.net/), *Latein haut rein* (http://www.lateinhautrein.de/), *Language Software to Teach Latin & Homeric Greek Vocabulary* (http://latin.homeric.greek.languages.jellyfishfun.com/), *Flash Latin & Greek Language Games* (http://hungryfrog.com/), *Verbix* (http://www.verbix.com/languages/latin.html) – a conjugator that shows verb inflections of Classic Latin.

The website *Navigium* (https://www.navigium.de/) contains educational software, grammar exercises, vocabulary, and the lexical simulator *Latein-Vokabeltrainer* – an optimal tool for effectively memorizing Latin vocabulary, while *Haudenverres* (http://www.haudenverres.de/) teaches the very mechanism for translating Latin texts.

Far fewer authoritative sites for learning Latin are developed and function on the territory of the former USSR. One of them is the site of the Department of Classical Philology of the Belarusian State University *Philologia classica* (http://graecolatini.bsu.by/) created 15 years ago. For studying Latin, the site offers 12 Belarusian textbooks and manuals for students of philological, historical, philosophical, and law specialties, a training complex for part-time students of philological and historical studies.

There is a new, original Latin-Russian dictionary, which is quite different from other such editions and is the first lexicographic research showing the dynamics of the development of Latin vocabulary (this version is also used by ABBYY Lingvo 12 ML) on the site. The chronological framework of the material is quite large: from classical Latin to modern terminology.

Also, the resource offers interesting texts and dialogues in Latin, a computer program-converter, which allows you to transfer the dates into the Gregorian and Julian calendars, the program *Titlo*, which translates numbers from a modern record into Roman numerals. The site also provides several collections of Latin proverbs and the student anthem Gaudeamus.

For 15 years now, another popular site *Lingua Latina Aeterna* (http://linguaeterna.com/la/) has existed. It's positioned as a living Latin page and unites the enthusiasts of the revival of this ancient language. The authors of the project compile their own Latin-Russian dictionary, plan a fundamental lexicographic work, which should include the vocabulary not only of the classical period but also the medieval one as well as neologisms reflecting the concepts of modern reality, create a Latin-Russian phrasebook. The site contains educational materials: the textbook *Латинский язык без труда*, an adapted Russian version of the textbook *Lingua Latina sine Molestia* with audio files, classical editions on Latin grammar and syntax, electronic dictionaries: *Lexicon Mediae Latinatis, Latin-Russian dictionary* (based on the Dvoretsky's dictionary), *The Great Latin-Russian dictionary* (the author is the founder of the site M. Polashev). Also, issues of teaching Latin, nuances of the Latin translation, new audio and video materials are regularly discussed on the site's forum. The work of the site is supported in four language versions: Latin, English, Russian and Ukrainian.

The webpage *Latinum.ru: Все о латинском языке* (http://latinum.ru/) hosts over 40 Russian-language textbooks, manuals and dictionaries on Latin for different specialties (lawyers, medics, biologists, philologists, teachers), the audiobook *Catchphrases in Latin*

and Russian, online translators.

Some of the most noteworthy of Russian-language resources are: *Латинск.ру – территория латыни* (http://latinsk.ru/), *На латыни про латынь* (http://www.latinpro.info/index.php), *Латинский язык (*https://www.lingualatina.ru/).

The Russian-language multimedia course *Быстрый вход в латынь* (Quick entry into Latin, I. Poloneichik) is designed for the widest possible audience and offers the minimum set of information about the language needed for mastering the skills of correct pronunciation and reading: dictionaries "mini-lex" (500 units) and "mini-phrase" (100 units) in text and audio versions, "mini-gramms" – mini-grammar with basic rules, texts, exercises, tasks and keys, audiobook, songs in Latin. The course consists of 25 video lessons and, as is clear from its name, does not claim to academic depth.

The portal *Internet Poliglot* (https://www.internetpolyglot.com/) also offered lessons in Latin in an interesting form. Users are encouraged to learn lexical units grouped by relevant topics and illustrated by slides and MP3s, and then to test knowledge in the form of games.

Besides several popular online resources for learning Latin are offered to a wide audience, special courses for concrete specialties are presented. As a rule, they are designed by teachers of educational establishments for students of part-time or distance learning forms and implemented on the Moodle platform. There are also electronic educational resources for distance support of the advanced study of Latin. For example, such an electronic resource based on the famous N. Katsman textbook was developed by D. Drozdova (DROZDOVA, 2011). The manual consists of 20 lessons, including the topic, recommendations for the study of grammar theory, grammar and vocabulary exercises, interactive control tests. In general, the resource seems prospective not only as a means for learning Latin but also as a tool for the accumulation of several educational content in the Latin language.

Among Ukrainian sites, *Pinax* (http://www.pinax.com.ua/) stands out. It provides materials from the courses of Latin Language, Ancient Greek and Culture of Ancient Greece and Rome by teachers of the Department of General Linguistics and Classical Philology of the Institute of Philology of the Taras Shevchenko National University of Kyiv. Latin course contains Latin grammar tables, analysis of nouns and adjectives, samples of exercises and tests, several articles, Latin phrases, versions of the anthem Gaudeamus translated by famous Ukrainian poets and university students, etc.

In 2009, the *Medievist. Ukrainian Latin Literature* project (https://www.medievist.org.ua/) was launched to combine the scientific works of modern authors, original Latin texts and translations on the one resource. The site is a platform where scholars can share their own works, communicate with colleagues, it's designed to carry out informational, innovative, and scientific missions. However, the specialists of the site also offer educational services: Latin courses, consultations on topics of normative grammar and syntax as well as in the field of medical, pharmaceutical, biological terminology.

Many universities and other higher educational establishments propose their own Latin courses developed on platforms Moodle and Ilias. For example, the Bukovinian State Medical University (https://www.bsmu.edu.ua/en/) offers a distance learning Latin course based on textbooks *Studeamus Linguae Latinae, Fundamentals of Recipes, and Clinical*

Terminology. The course contains 17 topics on the study of the module "Phonetics. The structure of the anatomical-histological term", 16 topics – on the module "Pharmaceutical terminology" and lexical and analytical-syntactic elaboration of the topic "Clinical terminology".

Since the 2010s, the National University of Life and Environmental Sciences of Ukraine has continued a long-term pedagogical experiment on the effectiveness of the use of e-learning tools in the veterinary students' training. The aim of the experimental research work was to carry out the system of pedagogical influence by means of e-learning tools, which has to increase the retention level of learning material, minimize didactic risks and improve the quality of the educational process in Ukrainian agrarian universities. Defining the research problem, methodology, experimental design, developing instruments, data collection and analysis were carried out by the author in the framework of Ph.D. thesis (BALALAIEVA, 2016).

In particular, an electronic textbook *Elementa Linguae Latinae* designed by the author's model was used in learning Latin. This e-textbook has a modular structure and there are two basic modules (Guide and Dictionary) and Help module in it (BALALAIEVA, 2019).

The Guide module contains a short course in Latin, in which basic phonetics and grammar knowledge required for mastering the skills of reading, writing, translation, and analysis of veterinary terms is provided in a concise and accessible form. The module provides the implementation of information, systematization and self-control functions. The information function is provided by fixing the substantive content of training at the level of grammatical material and is realized through the availability of information on Latin phonetics and grammar, as well as some professional topics; the systematization on is implemented at the language level – the training material is structured according to the subsystems of the language and presented in the format reference manual with cognitive-graphic models.

The Dictionary module consists of three sections: "Dictionary" itself (4000 entries), "Terminological elements" (300 entries), and "Phrases" (300 entries). The information function of the module is provided by fixing the substantive content of training at the level of terminology material, is realized through the availability of Latin/Ukrainian term's equivalent, information about the origin of terminological elements, semantization, and partial term interpretation. The dictionary in this aspect is considered as a source of information, a means of access to accumulated empirical knowledge in the subject field. The systematization function is implemented at two levels: language and terminology (a term itself by its very nature is systematic and the semantization of the term in the dictionary implies a description of a certain fragment of the terminology system).

The Help module contains general information about the textbook and program, a description of the structure of the dictionary and entry, the user's guide, a list of conditional abbreviations, references.

A total of 247 students of the faculty of veterinary medicine of NULES (National University of Life and Environmental Sciences of Ukraine) participated in the experiment. Students of the experimental group (n=123) trained using this tool and students of the control group (n=124) trained in traditional ways were evaluated through a system of standardized achievement tests in Latin language (data collection and analysis are described in detail in BALALAIEVA, 2016).

The following criteria have been established for the effectiveness of learning: motivation (indicators: focus and level of academic motivation), cognitive (indicators: quality and amount of knowledge), and activity (indicators: mastering practical skills, speed of execution of training tasks). The pedagogical experiment has proved the advantage of teaching efficiency with the use of e-learning tools. In particular, a positive changes' dynamic has been discovered in learning motivation focus, and in intrinsic motivation levels redistribution. Comparative analysis of the dynamics of educational motivation showed that the difference in the growth of the number of students with dominating intrinsic motives is 10.4% for the experimental group. The effectiveness of e-learning tools' use has been proved by the statistically significant increase of the retention level of learning material in experimental groups (in general, the average score in the experimental group is 0.51 higher than in the control one). The positive difference in learning was ascertained in the experimental group: the number of students with middle and high level of academic progress increased. In particular, the number of students with low progress in the experimental group is 14.2% less than in the control one, but the number of students with a middle and high levels of academic progress higher by 9.2% and 5% respectively. Also, it was found that the overall speed of execution of training tasks in the experimental group is 7.8% higher than in the control one.

As the final survey showed, the students in their work more often resorted to the help of the Dictionary module, as is the case with online resources, among which dictionaries are the most frequently used.

4 Dictionaries and translators

Online dictionaries and translators occupy a separate niche among electronic resources.

The Thesaurus Linguae Latinae Online (https://www.thesaurus.badw.de/en/project.html) is the largest and most detailed Latin dictionary in the world, based on the renowned print dictionary, designed to serve as a tool for both research and teaching preparation at the primary and university school levels, supported by 31 academies and scholarly societies from over 23 countries.

William Whitaker's WORDS (https://mk270.github.io/whitakers-words/operational.html) is an electronic dictionary for translating from Latin to English and vice versa. The computer program can parse variations of the forms of Latin words, give possible interpretations (case, person, gender, tense, mood, etc.), translate roots. According to the author, "the purpose of this dictionary in the overall scheme was to have a variety of words and types, from which the algorithms for the codes could be developed, and with which they could be exercised" (http://www.archives.nd.edu/words.htm). The dictionary is intended for beginning Latin students or amateur, but it has become very popular due to the wide coverage of the Latin vocabulary (about 39,000 entries) and accurate translation.

William Whitaker's WORDS provided the basis for many other dictionaries, for instance, *John Madsen Latin-English Dictionary* (about 42,000 entries), *Marco Waclawek Latein-Wörterbuch* (about 48,000 entries), etc.

One more product based on *William Whitaker's WORDS* is *NoDictionaries* (http://nodictionaries.com/) – a Latin dictionary look-up tool which generates an interlinear word list. The module *NoDictionaries: Latin Literature* contains literal translations of 49 classic authors, the module *NoDictionaries: Novifex* allows generating interlinear word lists of any text entered by the user.

Another product *Blitz Latin* (https://blitzlatin.com/), designed by White & Whitaker, is able to translate automatically not only words but also texts from Latin to English. It contains about 9,500 Latin standard phrases and more than 43,000 words. The specific feature of the dictionary is its flexibility – for the accuracy of the translation, the user can choose the period (classical or medieval), the sphere of language use (biological, medical, linguistic, law, and technical), to review all alternative meanings of the word. The dictionary offers three additional modules: *HTMStrip* – provides formatting of texts from HTML pages into text ready for translation; *Inscript* – a quick search tool for the database of inscriptions of Frankfurt University; *Counter* – counts Latin words in the text and provides statistical analysis.

The *Latin Lexicon. Numen* (https://latinlexicon.org/) is an online Latin dictionary based on some authoritative sources, in particular, *An Elementary Latin Dictionary* by Charlton T. Lewis, *A Latin Dictionary* by Lewis & Short and *Latinitas Recens*. This online dictionary has the fastest, efficient user interface and well-designed navigation system. The program offers not only the translation of the word but also its whole derivational paradigm and examples of use in the classical authors' works. The built-in tutorial *Word study tool* provides the ability to grammatically analyze words.

Classic dictionaries are also available online in a fully digitized and searchable form: *A Copious and Critical English-Latin Dictionary* by Smith & Hall (https://www.latinitium.com/smithhall), *A Latin Dictionary* by Lewis & Short (http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext %3A1999.04.0059&redirect=true), etc.

It also should be mentioned online Latin-German dictionaries: *Albert Martin Latein Wörterbuch* (https://www.albertmartin.de/latein/info.php) contains 36,500 entries, *Auxilium Lateinwörterbuch* (http://www.auxilium-online.net/wb/formenanalyse.php) contains 16,000 entries, is able to translate and parse forms of Latin words; Latin-Italian: *Olivetti Dizionario Latino* (https://www.dizionario-latino.com/dizionario-italiano-latino.php) – the largest online Latin-Italian dictionary with a conjugator and declination tool included, *Dizionario Latino Italiano (*https://www.gamoto.net/dizionario-latino/latino-italiano.htm*);* Latin-French: *Olivetti Dictionnaire Latin-Français* (https://www.grand-dictionnaire-latin.com/dictionnaire-latin-francais.php), *Lexilogos* (https://www.lexilogos.com/latin_dictionnaire.htm), *Traducteur Latin Français en ligne* (https://www.webtran.fr/latin/a-francais/); Latin-Spanish: *AULEX* (https://aulex.org/la-es/?idioma=en**),** *ePrevodilac Latin-Spanish translator* (https://en.eprevodilac.com/); Latin-Dutch: *Woordenboek Latijn-Nederlands (*http://www.latijnnederlands.nl/); Latin-Portuguese: *Dicionário de Latim* (https://www.dicionariodelatim.com.br/) – online Latin word and phrase dictionary with meanings and definitions in Portuguese, etc.

Latin-Russian dictionaries are fairly well represented in the network. In addition to previously mentioned e-dictionaries by I. Dvoretsky, M. Polyashev, the program *Latrus 1.2* (http://latinum.ru/load/1) should be noted (it contains a Latin-Russian dictionary (12,600 entries), a dictionary of Latin phrases and a guide on Latin grammar).

Users are also offered terminological dictionaries. For example, the *Latin-Russian-Latin Anatomical Dictionary (*http://www.ets.ru/pg/r/dict/anatomy.htm*),* the introduction of which in the *Polyglossum* vocabulary program preceded its printed publication. The authors of the dictionary aimed to conclude the maximum number of anatomical terms (about 30,000 entries) necessary for medical students, as well as medical practitioners and translators.

Latin became the 58th language proposed by *Google Translate* for direct and reverse translation. However, as our practice shows, translations from Ukrainian to Latin by *Google Translate* are far from perfect, as well as translations by other tools, such as the translator *Pragma 6 (*http://m.translate.ua/us*),* multilingual dictionary (https://www.slovnyk.org/), *Латинсько-український словник* (https://www.m-translate.com.ua/slovnik/latin/la-uk).

The Ukrainian-Latin online dictionary on *glosbe.com* (8,260 phrases in the Latin-Ukrainian translation and 7,765 in reverse) offers a translation from Latin to Ukrainian, possible word combinations, examples of the use of a word in a sentence. The disadvantages include the macaronic Russian-English interface (of Latin-Ukrainian dictionary!), in particular, the basic instructions are in Russian, and grammatical comments are in English, and occasionally in Polish.

A computer program and a family of electronic dictionaries *ABBYY Lingvo* developed by an ABBYY company has a huge database, but there are only 2 Latin-Ukrainian dictionaries in it: the selected Ukrainian part of *Lexicon Heptaglotton*, reconstructed by the text of V. Svoboda *Slavonic part of Oxford Heptaglotton: Ukrainian-Latin dictionary* of the first half of the 17th century and *Latin-Ukrainian/Ukrainian-Latin dictionaries of clinical and pharmaceutical terms.*

5 Conclusion

The general trends of implementation of information and communication technologies in the educational area have considerably expanded the possibilities of studying Latin, opened access to vast resources of libraries, allowed using the scientific and educational potential and experience of teaching Latin in the leading world universities.

The development of electronic resources for learning Latin is more advanced in European countries that have a strong educational tradition of teaching classical languages, as evidenced by the variety of products presented online (from entire platforms and websites to particular online courses, e-textbooks, tutorials, interactive tests, drill-and-practice programs, conjugators, dictionaries and translators etc.). In the post-Soviet countries (including Ukraine) the development of electronic content for learning Latin is gaining momentum. Using best practices of colleagues could help Classical teachers to effectively organize an educational process, diversify the set of tools, enhance their work, design domestic products for learning Latin.

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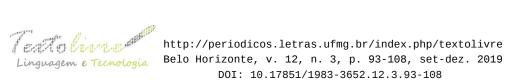
APPENDIX 1

Table 1: The results of a survey on evaluation of online resources and software for teaching and learning Latin.

		Credibility	Accuracy	Reasonableness	Support	Interactivity	Aesthetics	Accessibility	Communicative value	Pragmatic value	Cognitive value	Total
	E-libraries and databases											
1.	Perseus Digital Library	5	5	4	4	2	3	3	2	3	4	**35**
2.	Thesaurus Linguae Graecae	5	4	4	5	2	4	4	1	1	3	**33**
3.	Forum Romanum	4	4	3	3	2	4	3	1	1	3	**28**
4.	Latin Texts and Bible Versions	5	4	4	3	1	2	3	1	1	2	**26**
5.	Brepolis, or Brepols' Online Databases	4	4	4	3	2	3	1	1	1	3	**26**
6.	Textkit	4	3	3	3	1	2	2	2	3	2	**25**
7.	An analytic bibliography of online Neo-Latin texts	3	4	3	3	1	3	3	2	1	2	**25**
8.	Thesaurus Linguae Latinae	4	4	3	4	1	4	1	1	1	2	**25**
9.	Libellus	4	4	3	2	1	2	3	1	2	3	**24**
10.	Bibliotheca Latina IntraText	4	4	3	3	1	2	3	1	1	2	**24**
11.	Bibliotheca Teubneriana Latina	4	4	3	3	1	3	1	1	1	2	**23**
	Online courses, software, tutorials											
12.	Cambridge Latin Course	5	5	5	5	5	5	4	3	4	4	**45**
13.	Oxford Latin Course: Online	5	5	4	5	4	4	4	4	4	4	**43**
14.	Wheelock's Latin Series Website	5	4	4	5	4	5	3	5	3	4	**42**
15.	Ecce Romani	4	3	4	4	4	5	2	3	3	4	**36**
16.	Rosetta Stone Latin course	4	4	4	3	3	4	1	5	3	3	**33**
17.	Latinum Electronicum	4	3	3	3	4	3	1	4	4	4	**33**
18.	Latin Teaching Materials at SLU	4	4	3	3	3	2	3	3	4	4	**33**

19.	Latein Online	4	4	3	3	3	4	1	2	4	4	**32**
20.	Haudenverres	3	4	4	4	3	3	3	2	3	3	**32**
21.	Philologia classica	3	3	3	3	2	4	4	3	3	4	**32**
22.	Lingva Latina per se illvstrata	4	4	3	3	2	3	1	4	3	4	**31**
23.	Carmenta Online Latin	4	4	3	3	4	2	1	3	4	3	**31**
24.	Verbix	3	4	3	3	3	4	5	1	3	2	**31**
25.	Navigium	3	4	3	4	3	4	3	2	2	3	**31**
26.	Latin Flash Drill 5.0, Latin Vocab Drill 5.0	3	3	3	4	5	3	2	2	3	3	**31**
27.	Lingua Latina/WinLatin	3	2	3	3	5	5	3	2	2	3	**31**
28.	Latin Trivia and Quizzes	3	3	2	3	5	4	3	2	3	3	**31**
29.	Interactive Vocabulary and Grammar quizzes	3	2	3	3	5	4	3	2	3	3	**31**
30.	Lingua Latina Aeterna	3	3	3	2	2	3	4	3	3	4	**30**
31.	Transparent Language	3	3	3	4	3	2	1	2	2	3	**26**
32.	Internet Poliglot	3	2	2	2	4	3	3	2	2	3	**26**
33.	Linney's Latin Class	3	3	2	3	1	3	3	2	3	2	**25**
34.	Medieval Latin by UK National Archives	4	3	3	3	3	2	2	1	1	2	**24**
35.	Pinax	3	3	2	2	1	3	3	1	3	3	**24**
36.	Latein haut rein	2	2	2	3	2	2	3	2	3	3	**24**
37.	Nugae Latinae	3	3	2	2	1	2	2	4	1	3	**23**
38.	Schola Latina Europaea & Úniversalis	3	3	3	2	1	2	3	2	2	2	**23**
39.	KET's Distance Learning Latin Program	3	2	2	2	2	3	1	2	2	2	**21**
40.	Evan der Millner's Latin Language Course	3	3	2	3	1	2	2	2	1	2	**21**
41.	Language Software to Teach Latin	3	2	2	3	3	2	1	2	2	1	**21**

42.	Latin Online	3	2	3	2	1	1	2	1	3	2	**20**
43.	Power-Glide Latin Ultimate	3	2	2	3	2	1	1	1	2	3	**20**
44.	Latin pour debutant	3	2	2	2	1	2	3	1	2	2	**20**
45.	Latinum.ru: Все о латинском языке	2	2	2	2	1	2	3	1	2	3	**20**
46.	Латинск.ру – территория латыни	2	2	2	2	1	2	3	2	2	2	**20**
47.	На латыни, про латынь	2	2	2	2	1	2	3	1	2	3	**20**
48.	Быстрый вход в латынь	2	2	2	2	1	2	2	2	2	2	**19**
49.	Medievist	2	2	2	2	1	2	2	1	1	2	**17**
	Dictionaries and translators										
50.	The Thesaurus Linguae Latinae Online	5	5	4	4	3	3	1	2	2	3	**32**
51.	William Whitaker's WORDS	4	4	4	4	3	3	2	2	3	3	**32**
52.	Latin Lexicon. Numen	3	4	3	3	4	4	3	2	3	3	**32**
53.	NoDictionaries	3	4	3	4	3	3	4	2	3	2	**31**
54.	Albert Martin Latein Wörterbuch	3	3	3	4	3	3	3	2	3	3	**30**
55.	Blitz Latin	3	3	3	3	3	3	2	2	3	3	**28**
56.2	Auxilium Lateinwörterbuch	3	3	3	3	3	2	3	2	3	2	**27**
57.	Lexilogos	3	3	2	3	3	2	3	2	2	2	**25**
58.	Латинсько-український словник	2	2	2	3	2	3	3	2	2	3	**24**
59.	Latrus 1.2	2	2	2	2	2	2	3	2	3	3	**23**
60.	Pragma 6	3	2	2	2	2	2	2	2	2	2	**21**

Scale: 1 – very low, 2 – low, 3 – medium, 4 – high, 5 – very high.