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Research article

## Reviewing Learning and Teaching Content in the Scope of Artificial Intelligence: for Humanities and Social Sciences Majors

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**Abstract.** Social progress is largely determined by the degree to which digital reality is mastered by society as well as by the development and implementation of innovative technologies related to the use of artificial intelligence. Of particular relevance are issues related to the training of a new generation of specialists, who will be able not only to harmoniously fit into the current digital contexts of social life but also purposefully improve, develop and transform their professional digital tools. It is required to set and solve the tasks of developing students' competences at a high-quality level, which implies pedagogical specification of the modern educational content. The aim of the study is to elaborate a didactic apparatus for revising the modern educational content for students majoring in the humanities and social sciences, taking into account the current contexts of professional activity in digital reality. The authors have formulated a hypothesis that, in order to prepare humanities students to solve the ever more complex tasks of professional activity and communication in digital reality, it is necessary to update the educational content on an interdisciplinary basis, bringing it into line with the digital contexts of professional activity in this field and introducing a new content outline. This can be done if the following tasks are solved: (1) to define the current areas of work of a specialist in the humanities and social sciences in digital reality and, on this basis, create a digital profile for such a specialist, i.e., an invariant set of tasks relevant in the context of digitalization as well as the corresponding competences; (2) to determine a set of disciplines that have the greatest potential for implementing the digital profile of such a specialist; (3) to substantiate the project of changes in the educational content for students majoring in the humanities and social sciences; and (4) to conduct an experimental test of the draft changes in this educational content. The nominal data comparison method, namely the McNemar test, was used. The solution of the above tasks allowed us: in theoretical terms, to lay the conceptual foundations for selecting the actual educational content for students majoring in the humanities and social sciences in digital reality and, in practical terms, to propose specific tools for updating the subject content. The obtained results confirmed the hypothesis of the study and ways to update the educational content on an interdisciplinary basis, taking into account the current contexts of the professional activity in the social and humanitarian sphere in digital reality.

**Key words:** actual educational content, artificial intelligence, professional activity, humanities and social sciences, digitalization

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## Introduction

Artificial intelligence is one of the topics often discussed in the modern media space, in professional and scientific communities related to various subject areas, predictive models for the development of society, people or educational imperatives determined by the need to meet the social order for a new generation professional training system. Awareness at different levels of systematic research of the fundamental problems of artificial intelligence, as well as the depth and significance of the transformations supposed in connection with them in various spheres of society's life, required strategic decisions that could provide each of its members with a decent future and the entire country with sustainable development and competitive advantage in the international arena.

In the Russian Federation, a set of measures has been developed at the state level to ensure the intensification of work in this direction. Thus, Decree of the President of the Russian Federation of October 10, 2019, No. 490 "On the development of artificial intelligence in the Russian Federation" approved the National Strategy for the Development of Artificial Intelligence, which defines the goals and main objectives of developing artificial intelligence, as well as priority areas for the use of the technologies, and formulates provisions on measures aimed at using artificial intelligence for the implementation of strategic national priorities in the field of scientific and technological development.<sup>1</sup> Federal Law No. 123-FZ of April 24, 2020, regulates the conduct of an experiment on the introduction of artificial intelligence technologies in Moscow.<sup>2</sup> Thus, the problem of artificial intelligence is moving into the category of social priorities, opening up a new 'dimension' of our being, ways of reflecting it in the public and individual consciousness.

The designated strategy, in essence, turns out to be a challenge not only for professionals involved in the subject matter of the conceptual aspects of the problem, the development of the appropriate infrastructure, technological foundation, technical aspects of the introduction of artificial intelligence but also for the entire pedagogical community, designed to train competent specialists who can not only harmoniously fit into current digital contexts of social life but also purposefully improve, develop and transform their professional digital tools, set and solve new tasks at a qualitatively higher level. And if for engineering specialties the vector of development of education in the field of artificial intelligence is at least understandable, and it is associated with the development and research of machine

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<sup>1</sup> *On the development of artificial intelligence in the Russian Federation*. Decree of the President of the Russian Federation of October 10, 2019, No. 490. (In Russ.) Retrieved June 15, 2022, from <http://www.kremlin.ru/acts/bank/44731>

<sup>2</sup> Federal Law "On conducting an experiment to establish special regulation in order to create the necessary conditions for the development and implementation of artificial intelligence technologies in the constituent entity of the Russian Federation, the federal city of Moscow, and amending Articles 6 and 10 of the Federal Law 'On Personal Data' " dated April 24, 2020, No. 123-FZ. Retrieved June 15, 2022, from [http://www.consultant.ru/document/cons\\_doc\\_LAW\\_351127/](http://www.consultant.ru/document/cons_doc_LAW_351127/)

learning algorithms, the construction of architectures, the creation of applied systems of artificial intelligence and their subsequent integration, the study of issues related to decision-making by artificial intelligence (Levin et al., 2022; Bach et al., 2022; Feuerriegel et al., 2022; Mohtaj, Asghari, 2022; Suárez et al. 2021), the humanitarian and social areas of training, from our point of view, are in this respect underdetermined and underestimated.

The introduction of general professional competence “ОПК-9. Ability to understand the operating principles of modern information technologies and use them to solve problems of professional activity” into the federal state educational standards of higher education (FSES HE): bachelor’s/specialist’s<sup>3</sup> degrees in the humanities and social sciences to some extent improves the situation, filling in the obvious gap in the level of requirements for bachelor’s degree graduates, but does not radically change it, since the meaningful specification of this competence remains in the area of responsibility of the educational organization. At the local level, this means, at its best, familiarizing students with individual data management/retrieval systems or intellectual personal support tools. As for the FSES HE at the master’s degree level, the situation seems to be even more problematic. Firstly, not all areas of training provide for the formation of competences that imply the required level of proficiency in at least information technology (for example, this competence is not available for ‘Psychology’ and ‘Psychological and pedagogical education’). Secondly, even in those FSES HE where such competence is provided (see, for example, “ОПК-7. Ability to apply information technologies and use legal databases to solve problems of professional activity, taking into account the requirements of information security” for the master’s degree program in ‘Legal studies’ (40.04.01)<sup>4</sup>), the emphasis is made solely on the *user’s* competence, which at present is insufficient as even a preliminary analysis of the literature shows.

Thus, the results of a study conducted by A.N. Pinchuk and D.A. Tikhomirov indicate that, if humanities students have an acceptable level of awareness in robotic technology, virtual digital assistants, intelligent search systems, they clearly lack knowledge of *expert systems* related to the work of artificial intelligence algorithms (Pinchuk, Tikhomirov, 2019). Teaching humanities students to use the tools of a competent user seems to be an important but extremely narrow segment of educational activity, which obviously does not correspond to the promising areas for developing professions in digital reality. The digital world not

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<sup>3</sup> Order of the Ministry of Education and Science of the Russian Federation “On Amendments to the Federal State Educational Standards of Higher Education” dated November 26, 2020, No. 1456, registered with the Ministry of Justice of the Russian Federation on May 27, 2021, registration No. 63650; effective September 1, 2021. Retrieved July 7, 2022, from <https://www.garant.ru/products/ipo/prime/doc/400719549/>

<sup>4</sup> Order of the Ministry of Education and Science of the Russian Federation “On Approval of the Federal State Educational Standard of Higher Education – Master’s Degree in Law (40.04.01)” dated November 25, 2020, No. 1451, registered with the Ministry of Justice of the Russian Federation on March 9, 2021, registration No. 62681. Retrieved August 20, 2022, from [http://www.consultant.ru/document/cons\\_doc\\_LAW\\_378763/](http://www.consultant.ru/document/cons_doc_LAW_378763/)

only changes the formats of professional activity but also transforms the activity itself, which, in turn, also transforms this world.

An illustrative example of this is the inclusion of the artificial intelligence algorithms in the activities of law firms. These algorithms can replace a lawyer in performing a number of tasks, such as conducting a general or detailed classification of documents; preparing responses to appeals, complaints or lawsuits; obtaining the necessary data and checking them for compliance, etc. (Waisberg, Hudek, 2021). However, legal tasks related to abstract thinking, problem solving, client advocacy and counseling, human emotional intelligence, political analysis, and overall strategy will hardly ever be automated (Surden, 2019). The professional activity of a lawyer is changing in that it includes a new interaction vector, ‘man-machine’, where the lawyer refines the search, makes the necessary adjustments when working with the artificial intelligence algorithms, determines what tasks should be assigned to the ‘machine’ so that professional problems are solved in an ergonomic way.

In this context, the emphasis, as it is placed in the FSES HE OPC-9: bachelor’s and specialist’s degree programs in the humanities and social sciences or in GPC-7: master’s degree program in ‘Legal studies’ (40.04.01) (see above), on the technological support of activities of a specialist as *a user* of artificial intelligence and the related improvement of the *techniques and methods of teaching* humanities students is a necessary but obviously not sufficient condition for the pedagogical community to fulfill the social order for the system of training professional personnel. Therefore, it seems important to revise the *educational content* and, consequently, to determine a set of disciplines that will allow this content to be transformed, taking into account the current contexts of professional activity and communication in digital reality, which, in fact, determines *the purpose* of our study.

*The hypothesis of the study* is formulated as follows:

In order to prepare humanities students to solve the ever more complex tasks of professional activity and communication in digital reality, it is necessary to update the educational content on an interdisciplinary basis, bringing it into line with the digital contexts of professional activity in this sphere and introducing a new content outline. This can be done if the following *tasks* are solved:

1) based on the analysis of special literature, to define the current areas of work of a specialist in the humanities and social sciences in digital reality and, consequently, to create a digital profile for such a specialist, i.e., an invariant set of tasks relevant in the context of digitalization as well as the corresponding competences;

2) to determine a set of disciplines that have the greatest potential for implementing this specialist’s digital profile;

3) taking into account the obtained results, to substantiate the project of changes in the educational content for students majoring in the humanities and social sciences; and

4) to conduct an experimental test of the draft changes in this educational content.

The solution of the above tasks will make it possible: in theoretical terms, to lay the conceptual foundations for selecting the actual educational content for students majoring in the humanities and social sciences in digital reality and, in practical terms, to propose specific tools for updating the educational content.

### Literature review

The results of research in the social and humanitarian sphere reveal a wide range of opportunities in connection with the spread of end-to-end technologies<sup>5</sup> (Zaharia, 2011). The artificial intelligence algorithms are actively penetrating into jurisprudence, psychology, document workflow and other areas, defining several formats for their implementation, including:

- 1) activities directly related to ‘manual’ work;
- 2) standardized activities (routine operations);
- 3) activities related to providing services/‘transferring’ knowledge; and
- 4) creative activity (Halal et al., 2016).

The social and humanitarian sphere corresponds primarily to the third direction, i.e., activities related to providing services and/or ‘transferring’ knowledge. Teaching, law, management, art and other types of professional activity can be automated; however, the inclusion of artificial intelligence in these areas does not imply their “withering away” but rather their qualitative transformation. At the same time, the use of artificial intelligence makes it possible to delegate to it routine time-consuming operations and focus on more complex and creative tasks (Halal et al., 2016).

Researchers emphasize that a new wave of interest in artificial intelligence is already having a significant impact on the modern service market, which is growing and developing. Indicative in this respect is the legal sphere; for this reason, we will focus our attention primarily on it.

Legal activities involve solving a large number of diverse tasks, while only relatively structured and repetitive tasks (Remus, Levy, 2016) are subject to automation, and more and more “legal provisions” and positions become focused on managing legal processes (Susskind, Susskind, 2015). An important question concerns the formats of interaction between humans and artificial intelligence, since their approaches to performing specific tasks are different; at the same time, according to researchers, changing the ways of these interactions will inevitably lead to changes in legal practice and through it, the law itself, which requires a meaningful legal and regulatory approach to new technologies (Remus, Levy, 2016).

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<sup>5</sup> Rutkin, A.H. (2013). Report suggests nearly half of U.S. jobs are vulnerable to computerization. *MIT Technology Review*. Cambridge, Massachusetts: Massachusetts Institute of Technology Press. Retrieved July 15, 2022, from <https://www.technologyreview.com/s/519241/report-suggests-nearly-half-of-us-jobs-are-vulnerable-to-computerization/>

Researchers of artificial intelligence pay attention to its significant potential in the field of psychology: new professional tools also define new ways of collecting data, including the possibility of processing the results of information searches from the Internet, extracting information from digital documents or social networks (Zaharia, 2011). It can also refer to electronic psychodiagnostics and electronic psychological therapy, and, therefore, the need for professional personnel specially trained for this activity (Gratzer, Goldbloom, 2020).

Comprehending the processes of reformatting the professional activity of a modern specialist under the influence of artificial intelligence technologies, the researchers note that we generally differentiate the areas of professional activity, highlighting specialists in management, law, medicine or other subject areas, although what is more important here is not professional-subject differentiation but differentiation of the tasks that specialists face; therefore, we should focus on small, generalized tasks for which artificial intelligence-related technological solutions are applied<sup>6</sup> (Susskind, Susskind, 2015).

Such tasks may include:

1. Correct sampling of data for training artificial intelligence algorithms. With the advent of big data in the social and humanitarian sphere, changes are evident that determine the speed and method of collecting data as well as their openness (Nestik, 2017). To train the model, it is necessary to offer such a sample of data that would allow the model to subsequently cope with the tasks set with a minimum number of errors. To obtain a high-quality sample, a necessary condition is the involvement of a specialist in a specific subject area, who is prepared to solve problems of this kind.

2. Creation of a set of high-context data. From the point of view of the qualitative characteristics of data, the capabilities and power of the artificial intelligence algorithms directly depend on the accuracy of the used controlled data sets prepared for machine learning. In the research community, the lack of quality-labeled data and, if available, their accessibility, is a major concern (Bezboruah, Abhijit, 2020). Data quality affects the performance, fairness, reliability, security, and scalability of machine learning and artificial intelligence systems (Chen et al., 2021; Sáez et al., 2021).

3. Data annotation. Specialists involved in the labeling of ‘high-context’ data, such as, for example, the classification of legal contracts, medical images or scientific literature, must be *highly competent in the designated subject areas*.<sup>7</sup> At the same time, the special format of their activities requires a systematic approach both to the organization of such work and to their professional training,

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<sup>6</sup> LegalAcademy – artificial intelligence in law: a 3-year experiment. Retrieved May 25, 2022, from <https://www.youtube.com/watch?v=W9zW9rhNBH0>

<sup>7</sup> Data annotation: The billion dollar business behind AI breakthroughs. Retrieved October 5, 2022, from <https://medium.com/syncedreview/data-annotation-the-billion-dollar-business-behind-ai-breakthroughs-d929b0a50d23>

which opens up new horizons for educational organizations. Future specialists need to be purposefully ‘connected’ to the digital ‘dimension’ of their profession, to form their readiness to collect accurate data for training models, annotating them and compiling instructions for annotating.

4. Search refinement. In the professional segment, the artificial intelligence algorithms are trained by *experts in this field* (Ashton, 2022; Bakker et al., 2018; Kotsoglou, 2020; Yu, Spina Ali, 2019). This is due to the specifics of work in a particular area. Expert observers determine how to prepare conclusions, requests and reports based on significant facts established by the artificial intelligence algorithms.

5. Interpretation of decisions made by the artificial intelligence algorithms (analysis of decision-making by the artificial intelligence algorithms). When deep neural networks are used, it is impossible to detect an error in the system at this stage of their development, since the decision-making process is not transparent. At the same time, the use of models that “open the black box” and make it possible to exclude an error in the operation of the model requires the involvement of experts to detect and then explain the error (Von Eschenbach, 2021).

6. Making suggestions for correcting the work of the algorithms. When new conditions or changes appear in the professional segment, it is necessary to monitor and introduce them into the model in a timely manner. If the expert does not make actual changes at the stage of model training, significant errors will appear at the stage of using the model, which will reduce the quality of the resulting product (Kosov, 2019).

Thus, based on the analysis of the literature and understanding of its results, we can draw the following intermediate conclusions that are important for organizing the subsequent stages of the study:

1. Determining the place and role of artificial intelligence in the professional activities of a modern specialist in the humanities and social sciences, we will proceed from the fact that the trend is not to displace a person with artificial intelligence from the profession but to expand *the specialist’s professional tools* by attracting artificial intelligence technologies, providing additional opportunities for creative self-realization of a professional personality.

2. For a modern humanitarian, it is important not only to know how to use the tools of artificial intelligence available to a particular subject area or profession, for solving the problems of educational and, in the future, professional activities, but *to be ready at an expert level to evaluate the possibilities of specially subject-specific ‘tuning’ of these tools, taking into account relevant subject knowledge and context(s) of activity*. In this regard, in the pedagogical terms, it is necessary to establish what are the constructive and technological resources (*i.e.*, functionality) of artificial intelligence in the subject area or profession being mastered by the student, and how, in this regard, the educational content of the disciplines in the curriculum should change.

3. After analyzing and summarizing the results of studies of existing and prospective digital contexts of professional activity of specialists in various fields presented in the special literature, we see that the basis for further understanding of artificial intelligence technologies in the social and humanitarian sphere of interest to us should be not differentiation of areas of professional activity but rather differentiation of professional tasks facing specialists in terms of working with artificial intelligence. This gives us reason to raise the question of the invariant set of such tasks and the corresponding set of competences that form the digital profile of a specialist in the humanities and social sciences, as well as the possibility of its pedagogical concretization in the educational content of the disciplines in the curriculum.

### **Materials and methods**

The analysis of special literature and the generalization of its results determined the content of the subsequent stages of the study and the methods used:

– through pedagogical modeling, based on the summarized results of the analysis of scientific sources, a *Specialist's Digital Profile* in relation to the humanities and social sciences (invariant model) was developed;

– using the methods of analysis, data generalization and pedagogical modeling, a set of disciplines with the greatest potential for the implementation of the *Specialist's Digital Profile* was determined, and a project of changes in the educational content was substantiated; and

– an experimental test of the proposed project (pilot study) was carried out, the results of which were processed using statistical methods corresponding to the characteristics of the study.

To establish the significance of differences between the value in the hypothesis and the value obtained from the sample, one of the methods for comparing nominal data was used, i.e., the McNemar  $\chi^2$  test, which is a special case of using the  $\chi^2$  distribution when two related populations are compared. This test is analogous to the parametric Student's test and the nonparametric Wilcoxon test and is used to analyze related measurements in the event of a change in response using a dichotomous variable.

In this study, two registrations were made on the same sample of subjects (i.e., dependent sample), which reflects the results of one group of the subjects before and after training. Comparable indicators were measured in a non-metric nominal scale (able to use professional tools/unable to use professional tools).

Experimental testing was carried out at the Moscow State Linguistic University in 2019–2022. It involved four groups of first-year master' students (out of four cohorts) majoring in 'Legal studies' (40.04.01). The total number of the participants was 32 people. The format of verification by cohorts was chosen due to a small quantitative composition of master's groups in this area of study as well as the desire of the experimenters to verify the obtained results.



The choice of this area of training was determined by objective and subjective factors: a fairly active entry of the legal community into the context of artificial intelligence; a significant amount of specialized literature on this issue and many unresolved problems, including those related to the process of special training of professional personnel for work in electronic formats; and the fact that the organizers of the study have special legal and linguistic education and experience in working with law students (at the levels of bachelor's, master's and post-graduate studies).

The choice of the educational level of the master's degree was due to the specifics of the research tasks to be solved, related to:

a) the condition of sufficient immersion of the students in the professional sphere, as evidenced by the fact that the students had a bachelor's degree in 'Legal studies' (40.03.01), which allowed them to work in their specialty (essential condition);

b) the need to determine the level of readiness of the bachelor's graduates to work in a digital reality (and, on this basis, make a decision on the advisability of updating the educational content at the next level of education); and

c) the composition of the master's groups, in which, as a rule, the bachelor's graduates of a certain field of study from different universities were represented, which increased the level of generalization of the results.

The level of readiness of the students to work in a digital reality was determined using the questionnaire composed by the authors and supplemented by practical tasks offered to the students at the beginning and at the end of the master's course (the tasks were not repeated), according to the following scale (correlated with the *Specialist's Digital Profile*):

0 – zero level (the student is not familiar with professional tools in the field of robotic technology, virtual digital assistants, intelligent search engines, etc.);

0/A – threshold level (the student has a general understanding of professional tools in the field of robotic technology, virtual digital assistants, intelligent search engines, etc., but does not have significant experience working with them, i.e., in solving educational and/or professional tasks);

A – level of professional user of digital instruments; and

B – level of expert technologist of digital tools.

At the zero and threshold levels, further concretization of the results was not provided: at higher levels (A, B), the students were asked to solve certain tasks corresponding to each of the levels of their readiness to work in a digital reality.

*Questionnaire content:*

1. What professional tools of a lawyer are known to you in the field of robotic technology, virtual digital assistants, intelligent search engines, etc.?

2. Which of the digital tools listed by you in Paragraph 1 have you dealt with in the conditions of your educational and/or professional activities?

3. What professional tasks did you solve at the same time?

4. Did you solve the tasks yourself or with the help of a more experienced colleague?

5. How often do you have to solve such tasks?

6. Estimate approximately the percentage of professional tasks solved by yourself, using digital tools:

– less than a quarter;

– about a quarter;

– about half;

– two thirds;

– almost all.

II. *Practical tasks* (at the beginning of the training course):

7. Conduct a discourse analysis of the text below.

8. Make an annotation of the document given in the text for an electronic database (preparation of data sets for training artificial intelligence algorithms).<sup>8</sup>

“A red-haired bearded militiaman entered the office... and registered Umilitsiya’s child” (Ilf, Petrov, 2000, pp. 381–382).

III. *Practical tasks* (at the end of the training course):

9. Conduct a discourse analysis of the text below.

“Look at these walls... to collect all the debts, all the money obligations, of the whole city? It is a misery to be a man!”<sup>9</sup>

10. Make an annotation of the document given in the text for an electronic database (preparation of data sets for training artificial intelligence algorithms).

“On January 27, 2021, U.S. District Judge Raymond P. Moore... American consumers’ data to clients engaged in fraud.”<sup>10</sup>

## Research results

The differentiation of professional tasks and relevant competencies of a specialist in the humanities and social sciences in the context of working with artificial intelligence allowed us to create the *Specialist’s Digital Profile*, highlighting the following two levels of inclusion of such a specialist in a digital reality:

a) information technology level, i.e., that of a professional user associated with the use of ready-made digital tools in professional activities; and

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<sup>8</sup> The materials for the analysis were presented both in English and in Russian, since, firstly, the specifics of the educational program “International Justice” implemented at the Moscow State Linguistic University is associated with the formation of the willingness of a professional person to work in an intercultural legal space in the context of a conflict of legal cultures and, secondly, the skills we test are interdisciplinary in nature. However, at the beginning of the course, preference was given to Russian-language texts and later to English-language ones.

<sup>9</sup> The Dream Play. A monologue from the play by August Strindberg. Retrieved November 7, 2022, from [http://www.monologuearchive.com/s/strindberg\\_016.html](http://www.monologuearchive.com/s/strindberg_016.html)

<sup>10</sup> United States v. Epsilon Data Management, LLC. Retrieved December 7, 2022, from <https://www.justice.gov/civil/current-and-recent-cases>

b) expert technologist level, i.e., that of an expert technologist of digital tools, which implies the expert participation in technological processes related to the ‘zone of proximal development’ of artificial intelligence.

Each of these levels, being extrapolated into educational contexts and having received the appropriate pedagogical concretization, can be structured into the following three content blocks as projected components of the actualized interdisciplinary educational content:

1) a block of linguo-cognitive support of the technological process (includes a discursive analysis of communication practices in the relevant subject area, semantic analysis of a special text, i.e., competences that are important both for a professional user and for an expert technologist of digital tools used in the context of artificial intelligence);

2) an instrumental block that provides tools for a professional user (front-end box) and/or an expert technologist (deep-end box) in the context of artificial intelligence; and

3) an interactive block that provides reinforcement based on the results of interaction.

Further work aimed at updating the educational content for students majoring in the humanities and social sciences involves establishing a list of disciplines that have the potential necessary to solve the relevant didactic tasks when it comes to a specific contingent of students. At the same time, the project of changes includes two possibilities: updating the content of the work programs of currently implemented disciplines and/or developing new programs, depending on the results of the analysis of the real state of things in this area.

Thus, for example, the curriculum of the discipline ‘Legal studies’ (40.04.01) as part of the International Justice training area, the content of the work programs of academic disciplines and the methodological apparatus used show that, if students have special subject-specific competences (in this case, legal ones) – an essential condition for the projected content model – a significant potential for the implementation of Block 1 (linguo-cognitive support of the technological process) is possessed by the discipline ‘Foreign language in legal studies’. It is focused on working with textual material, implemented in the linguo-cognitive paradigm; the textbooks offered in the master’s course use elements of discourse analysis and semantic text analysis important in the data markup procedure for training artificial intelligence algorithms (see also Block 2), and electronic legal communication formats. Therefore, there is already some methodological basis on which the educational content model can be updated in a digital reality. Moreover, within the framework of this discipline, it is possible to work with foreign texts and databases, which is especially relevant at the present time. It is this block that provides the expert technologist level (level B) of the *Specialist’s Digital Profile*. At the same time, such meaningful updating of the methodological apparatus of

the discipline significantly changes its status in the conditions of a non-linguistic university, transferring it to the category of key ones.

Block 2 (instrumental) can be provided by the discipline ‘Digital technologies in the search, analysis and visualization of big data in legal studies’, while the content of this discipline, in our opinion, requires regular updating, taking into account the development of new technologies and the constant updating of a lawyer’s digital tools, which fully corresponds to the practice of annual updating of educational programs adopted in institutions of higher education. Training, obviously, should be introductory but rather involve the recurrent entry of master’s graduates into the professional field to solve educational and professional problems using professional digital tools: studying the Legaltech platform; consideration of modern information technology solutions (constructors of legal documents, services that create legal bots) as well as programs for recording court cases, services for checking the compliance of documents with legislation, working with databases. The developed competences can be supported in the interdisciplinary field at the stage of developing subject, communicative and digital competences within the disciplines ‘Communicative technologies in legal practice’, ‘Foreign language in legal studies’, subject to appropriate updating of their content.

Block 3 (interactive) can be implemented within each of the above disciplines, including the following ones: ‘Workshop: design in legal activity’, ‘Legal expertise in national and international lawmaking’, etc. Special legal disciplines are associated with an expert assessment of the results obtained in the ‘man-artificial intelligence’ interaction. Students acquire the opportunity at an expert level to consider and assess the reliability of the artificial intelligence algorithms used, to analyze controversial issues of legal regulation of artificial intelligence, etc.

Thus, the analysis of the potential of the considered academic disciplines allowed us to conclude that ‘Foreign language in legal studies’ has the necessary methodological base and significant potential for realizing the goals at this stage of the study. Even at the initial stage of developing competences of a professional user, who deals with ready-made digital tools in professional activities (within the discipline ‘Digital technologies in the search, analysis and visualization of big data in legal studies’), the discipline ‘Foreign language in legal studies’ allows one to simultaneously set to ensuring the expert technologist level (level B) of the *Specialist’s Digital Profile*. ‘Foreign language in legal studies’ has a significant integrative potential of interdisciplinarity, which is confirmed by the coincidence of opinions of a number of authors on this issue (Khomyakova, Verbitsky, 2015; Yarotskaya, 2016; Yarotskaya et al., 2020).

On this basis, the experimental test was focused around this key link, with the inclusion of special legal disciplines and subjects of information technology orientation.

The experimental test in each of the student cohorts took place in the following two stages:

1. The preliminary check, the purpose of which was to determine the initial level of readiness of the students to work in a digital reality in accordance with the *Specialist's Digital Profile* (at the beginning of the master's course). According to the results of the first stage (preliminary checks), it was revealed that 90.6% of the master's students (29 out of 32) were unfamiliar with the professional tools of a lawyer in the robotic technology. However, 71.8% of the students (23 out of 32) mentioned 'document constructor/' among such tools. Almost all the students noted that they either had not dealt with such problems or turned to the help of more experienced colleagues to solve them. The results in terms of indicators in the streams were evenly distributed, which, in our opinion, indicates the typicality of this situation and the stability of the characteristics.

2. The control check was carried out at the end of the experimental training (i.e., the master's course), during which the students on a regular basis solved problems corresponding to the three content blocks of the *Specialist's Digital Profile* (levels A and B). The purpose of the control check was to determine the level of readiness of the students in accordance with the *Specialist's Digital Profile* (0 = the zero level; 0/A = the threshold level; A = the level of a professional user of digital tools; B = the level of an expert technologist of digital tools).

The analysis of the obtained results allows us to conclude that the students' awareness of professional tools has increased from 9.3% (3 students out of 32 according to the results of the preliminary checks) to 93.7% (30 students out of 32).

As part of the study, the following two statistical hypotheses were formulated:

– H0 (null hypothesis): the difference in the results of the students in the framework of the preliminary and control checks is caused by random reasons (a consequence of the fact that the estimates for the sample were obtained with some error); and

– H1 (alternative hypothesis): the difference in the results of the students at different stages of testing is determined by the effectiveness of the chosen teaching method.

Based on the results of two stages of testing the students, the resulting four-field Table was built.

**Awareness level assessment**

		Test 2	Test 2	Total
		Aware	Unaware	
Test 1	Aware	3 (A)	0 (B)	3
Test 1	Unaware	27 (C)	2 (D)	29
Total		30	2	32

Cells A–D show changes in the level of the students' awareness (able to use professional tools/unable to use professional tools) as a result of learning.

Since the calculated value of the statistic ( $\chi^2 = 27$ ) exceeds the tabulated critical value, the null hypothesis ( $H_0$ ) is rejected. Thus, we accept the hypothesis of statistical significance of differences at the level of  $p \leq 0.0001$  and can state that the chosen training method is effective.

### Conclusion

In the course of the study, we analyzed the state of things in the field of preparing students majoring in the humanities and social sciences for solving a wide range of topical tasks of professional activity and communication in a digital reality. After analyzing the specialized literature, we identified the current areas of work of a specialist in the social and humanitarian sphere in a digital reality and, on this basis, created a *Digital Profile* for such a specialist. Using the discipline ‘Legal studies’ as an example, we developed an algorithm for pedagogical activities related to the design and updating of the interdisciplinary educational content for such specialists, and identified a set of relevant disciplines and their potential in implementing the *Specialist’s Digital Profile*. In particular, the following disciplines were selected as the *basic* ones for carrying out transformations of the educational content: ‘Communication technologies in legal practice’, ‘Foreign language in legal studies’ and ‘Digital technologies in search, analysis and visualization of big data in legal studies’. Similar disciplines are represented to various extents in almost all other areas of the humanities and social sciences (adjusted for the relevant subject area), which gives us reason to assume that the obtained results can be used in other subject areas, and also indicates the expediency of continuing research on a larger scale.

In addition, we identified a number of ‘supporting’ disciplines (for the legal sphere). Taking into account the data obtained, the project of changes in the educational content of these disciplines was substantiated and its experimental testing was carried out.

The obtained results have confirmed the hypothesis of the study and made it possible to conclude that it is expedient to use the proposed mechanism for updating the educational content on an interdisciplinary basis, bringing it into line with the digital contexts of the professional activity of a specialist in the humanities and social sciences. At the next stage of the study, we are planning to expand the contingent of participants in experiential training due to the inclusion of students majoring in other disciplines of the social and humanitarian profile.

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Исследовательская статья

## Актуализация содержания обучения студентов социально-гуманитарного профиля подготовки в контуре искусственного интеллекта

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**Аннотация.** Общественный прогресс в значительной степени определяется уровнем освоения социумом цифровой реальности, разработкой и внедрением инновационных технологий, связанных с применением искусственного интеллекта. Актуальность приобретают вопросы подготовки нового поколения специалистов, способных не только гармонично вписаться в актуальные цифровые контексты жизни социума, но и целенаправленно совершенствоваться, развивать, преобразовывать свой профессиональный цифровой инструментарий. Для этого необходимо формировать компетенции обучающихся на высоком качественном уровне, что предполагает педагогическую конкретизацию современного содержания обучения. Цель исследования – разработка дидактического аппарата для пересмотра современного содержания обучения студентов социально-гуманитарного профиля подготовки с учетом актуальных контекстов профессиональной деятельности в условиях цифровой реальности. Сформулирована гипотеза о том, что для подготовки студента-гуманитария к решению постоянно усложняющихся задач профессиональной деятельности и профессионального общения в условиях цифровой реальности необходимо актуализировать содержание обучения на междисциплинарной основе, приведя его в соответствие с цифровыми контекстами профессиональной деятельности специалиста такого профиля и представив новый контур содержания. Установлены актуальные направления работы специалиста социально-гуманитарного профиля в условиях цифровой реальности и создан цифровой профиль такого специалиста – инвариантный набор задач, актуальных в контексте цифровизации, и соответствующие ему компетенции. Определен комплекс дисциплин, обладающих наибольшим потенциалом в реализации цифрового профиля специалиста. Обоснован проект изменений в содержании обучения студентов социально-гуманитарного профиля подготовки. Проведена опытная проверка проекта изменений в содержании обучения. Использовался метод сравнения номинальных данных – критерий Мак-Немара. Решение поставленных задач позволило: в теоретическом плане – заложить концептуальные основания для отбора актуального содержания обучения студентов социально-гуманитарных направлений подготовки в условиях цифровой реальности, а в практическом отношении – предложить конкретные инструменты для актуализации предметного содержания. Полученные результаты подтвердили гипотезу исследования и пути актуализации содержания обучения на междисциплинарной основе с учетом актуальных контекстов профессиональной деятельности специалиста социально-гуманитарного профиля в условиях цифровой реальности.

**Ключевые слова:** актуальное содержание обучения, искусственный интеллект, профессиональная деятельность, социально-гуманитарный профиль, цифровизация

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